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# Southeast Asia at the crossroads: Three paths to prosperity

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# Preface

The Association of Southeast Asian Nations (ASEAN) is a coalition of ten diverse nations: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. The region has posted strong growth since 2000, lifting millions out of poverty—but many gaps and disparities remain.

As Southeast Asia pushes to deepen its ties by completing the ASEAN Economic Community integration plan, the region is starting a new chapter in its economic development. But it will take the right set of catalysts to ignite more dynamic and inclusive growth. MGI's analysis finds that global trade flows, urbanization, and disruptive technologies could provide the keys to unlocking the region's full potential and creating wider prosperity.

This report is the result of collaboration between the McKinsey Global Institute (MGI) and McKinsey's six offices in Southeast Asia. It is part of a large body of MGI research on the region's economies, including *Myanmar's moment: Unique opportunities, major challenges*; *The archipelago economy: Unleashing Indonesia's potential*; and *Sustaining Vietnam's growth: The productivity challenge*. The project was led by Oliver Tonby, managing director of McKinsey in Southeast Asia, and Jonathan Woetzel, an MGI director in Shanghai. Fraser Thompson, an MGI senior fellow based in Singapore, directed the research. The research team, led by Gillian Lee and Darrell Leong, comprised Tarang Agarwal, Claire Ong, Beth Smith, Elita Subaja, and Valerie Tan. Research assistance was provided by the MGI economics research team, including Alan FitzGerald, Eduardo Doryan Jara, Giacomo Meille, Carlos Molina, Moira Pierce, Vivien Singer, and Soyoko Umeno. Thanks go to Lisa Renaud, who provided editorial support; and to our colleagues in operations, production, and external relations, including Sharmeen Alam, Marisa Carder, Vanessa Gotthainer, Deadra Henderson, Julie Philpot, and Rebeca Robboy.

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We particularly thank our academic advisers: Martin N. Baily, the Bernard L. Schwartz Chair in Economic Policy Development at the Brookings Institution; Richard Cooper, Maurits C. Boas Professor of International Economics, Harvard University; and David Skilling, director of the Landfall Strategy Group.

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This report contributes to MGI's mission to help business and policy leaders understand the forces transforming the global economy, identify strategic locations, and prepare for the next wave of growth. As with all MGI research, this work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution. We welcome your comments on the research at MGI@mckinsey.com.

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IN BRIEF

# Southeast Asia at the crossroads: Three paths to prosperity

The Association of Southeast Asian Nations (ASEAN) encompasses Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam—countries with a multitude of ethnicities and languages as well as wide economic disparities. But these nations are tied together by multiple threads of history and culture, and today they are increasingly linked by business networks, trade relationships, migration, and shared resources. Almost five decades after the organization's founding, ASEAN is pursuing more ambitious goals for integration.

Southeast Asia has enjoyed remarkable economic progress in recent years. Viewed as a single entity, the region would rank as the seventh-largest economy in the world. But much of its recent growth has been generated by an expanding labor force and the shift of workers from agriculture to manufacturing. These factors will eventually fade, which creates new urgency for confronting the region's low levels of productivity. To sustain economic growth, many member states will need to more than double their historic rates of productivity improvement.

Southeast Asia can address its productivity challenges and find new catalysts for growth by carving out its own unique opportunities from three global megatrends:

- **Capturing a greater share of global flows.** The global economy has become deeply interconnected as huge volumes of goods, services, capital, people, and data move across borders. Southeast Asia can capitalize on this phenomenon by accelerating implementation of the ASEAN Economic Community integration plan to create a single market of 600 million consumers. It can also take steps to build a more competitive manufacturing sector that could attract additional production from multinationals as labor costs rise in China. Together these opportunities could create some $280 billion to $615 billion in annual economic value by 2030.

- **Riding the urbanization wave.** The booming cities of Southeast Asia account for more than 65 percent of the region's GDP today, and more than 90 million people are expected to move to urban areas by 2030. This shift will support the continued growth of the "consuming class," which could double to 163 million households by 2030, making Southeast Asia a pivotal market of the future for companies in a range of industries. Keeping pace with this growth and creating cities with a high quality of life will demand some $7 trillion in investment in infrastructure, housing, and commercial space. By 2030, the continued growth of cities could add some $520 billion to $930 billion to the region's annual GDP.

- **Deploying disruptive technologies.** Five related technologies—the mobile Internet, big data, the Internet of Things, the automation of knowledge work, and cloud technology—could modernize sectors across the economy and drive major productivity improvements. Within many industries, large value is at stake for companies that move quickly to digitize. We estimate that disruptive technologies could produce $220 billion to $625 billion in annual economic impact for Southeast Asia by 2030, but the region will need to prioritize building out backbone infrastructure to capture this opportunity.

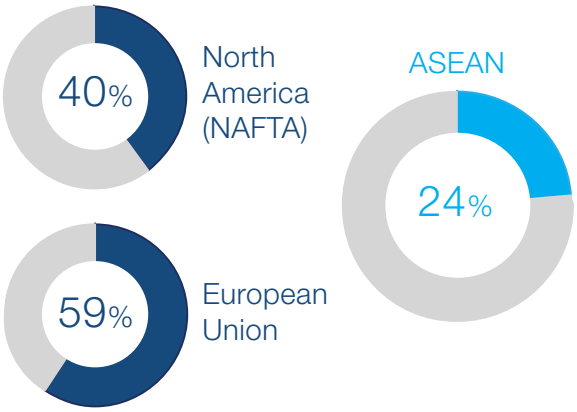
Global flows, urbanization, and technology are already reshaping the region. But if policy makers and businesses prioritize the opportunities associated with these trends, the results could be transformative. Southeast Asia could be poised to make major strides in economic development and to expand the possibilities for what integration can achieve.

# Three global trends create opportunities to transform Southeast Asia by 2030

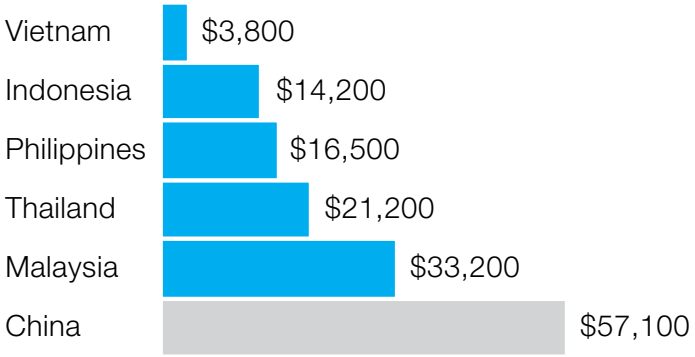
## 1 Capturing a greater share of global flows

Up to $615 billion in annual economic value

The ASEAN Economic Community (AEC) sets the stage for greater intraregional trade




To attract more global production, Southeast Asia must raise labor productivity

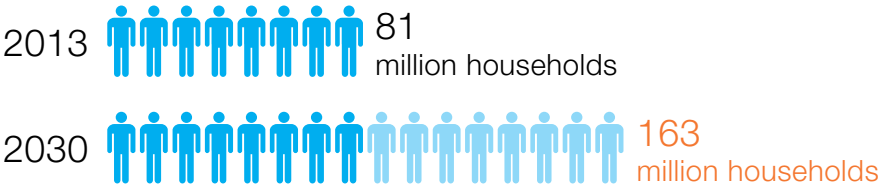



Annual manufacturing output per worker, 2012

## 2 Riding the urbanization wave

Up to $930 billion in annual economic value

An expanding consumer class




$7 trillion in investment needed for infrastructure, housing, and commercial space

## 3 Deploying disruptive technologies

Up to $625 billion in annual economic value

Mobile Internet | Big data | Internet of Things | Automation of knowledge work | Cloud

# Executive summary

The Association of Southeast Asian Nations (ASEAN) is a coalition that encompasses Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. At first glance, it appears to be an unlikely union of ten nations with a multitude of ethnicities, languages, and religions—not to mention starkly contrasting political systems and income levels. But Southeast Asia is tied together by multiple threads of history and culture as well as common geopolitical concerns. Today it is also increasingly linked by business networks, trade relationships, migration, and shared resources.

Now, almost five decades after the organization's founding, ASEAN is pursuing a more ambitious form of economic integration as a tool for achieving broader regional prosperity and greater global competitiveness. This aspiration is not yet a working reality on the ground, but there has been tangible progress in areas such as eliminating tariffs. If the region's leaders succeed in dismantling other types of barriers that hinder the movement of goods, services, capital, and skilled workers across its borders, ASEAN stands to reap the benefits of increased trade, production, and investment.

The region has experienced two decades of robust economic growth, which has successfully lifted millions out of poverty and created a middle class with newfound spending power. Consider the numbers: if ASEAN were a single country, it would already be the seventh-largest economy in the world (Exhibit E1). Its combined GDP of $2.4 trillion was more than 25 percent larger than India's economy in 2013. Home to more than 600 million people, it has a larger total population than the European Union or North America. ASEAN has the third-largest labor force in the world, behind only China and India, and its youthful

**Exhibit E1**

**ASEAN has experienced rapid growth and relative stability since 2000**

| GDP 2013, current prices<br>$ trillion | | Real GDP growth, 2000–13<br>% | | GDP growth volatility, 2000–13[1]<br>% | | Share of debt to GDP, 2013<br>% | | Inflation rate, 2013<br>GDP deflator, % | |
|---|---|---|---|---|---|---|---|---|---|
| United States | 16.8 | China | 10.0 | Russia | 4.2 | Japan | 243.2 | India | 7.0 |
| China | 9.3 | India | 7.0 | India | 2.4 | Italy | 132.5 | Russia | 6.5 |
| Japan | 4.9 | **ASEAN** | **5.1** | United Kingdom | 2.3 | United States | 104.5 | Brazil | 6.5 |
| Germany | 3.6 | Russia | 4.4 | Italy | 2.3 | France | 93.9 | **ASEAN** | **2.8** |
| France | 2.7 | Brazil | 3.2 | Germany | 2.3 | United Kingdom | 90.1 | Germany | 2.3 |
| United Kingdom | 2.5 | Canada | 1.9 | Japan | 2.2 | Canada | 89.1 | United Kingdom | 2.1 |
| **ASEAN** | **2.4** | United States | 1.8 | Brazil | 2.2 | Germany | 78.1 | China | 1.7 |
| Brazil | 2.2 | United Kingdom | 1.5 | China | 1.8 | India | 66.7 | United States | 1.5 |
| Russia | 2.1 | Germany | 1.1 | United States | 1.7 | Brazil | 66.3 | Canada | 1.5 |
| Italy | 2.1 | France | 1.0 | Canada | 1.7 | **ASEAN** | **46.7** | Italy | 1.4 |
| India | 1.9 | Japan | 0.8 | France | 1.6 | China | 22.4 | France | 1.1 |
| Canada | 1.8 | Italy | 0.0 | **ASEAN** | **1.5** | Russia | 13.4 | Japan | -0.6 |

1 Standard deviation of GDP growth rate.
SOURCE: IHS; *World economic outlook,* International Monetary Fund, April 2014; McKinsey Global Institute analysis

population is producing a demographic dividend. The region proved remarkably resilient in the aftermath of the 2008 global financial crisis, and today gross government debt is less than 50 percent of GDP, far lower than the levels in many developed economies.

Despite its momentum, Southeast Asia faces some pitfalls on its current trajectory—and low productivity ranks chief among them. Although productivity has been rising in recent decades, much of this progress was driven by a broad shift of labor from agriculture into more efficient sectors, rather than improvements within sectors. Productivity remains at worryingly low levels in most Southeast Asian countries, which hampers their ability to continue to raise living standards. Unless the region builds a more competitive manufacturing sector, it could miss out on the opportunity to secure more production from multinational corporations. While demographics are still favorable, the boost to economic growth from an expanding workforce will eventually begin to taper. In fact, some of the region's countries will need to more than double their historic rates of productivity gains to sustain their pace of economic growth. Beyond its productivity imperative, Southeast Asia faces urgent priorities in addressing infrastructure, housing, and education. Existing gaps and shortfalls could constrain the region's potential without the right set of catalysts to propel growth in the decades ahead.

Southeast Asia can address many of these challenges by carving out its own unique opportunities from three global megatrends: the ongoing expansion of cross-border trade, unprecedented urbanization, and the advent of multiple disruptive technologies. These forces are already reshaping the region. But they are unlikely to lift it to the next level of economic development in the absence of an active strategy for capitalizing on them. If policy makers and businesses prioritize the opportunities associated with these trends and build a forward-looking growth agenda around them, however, the results could be transformative. While some of their effects could overlap, we calculate that each of these catalysts could boost annual GDP by hundreds of billions of dollars by 2030 (Exhibit E2).[1]

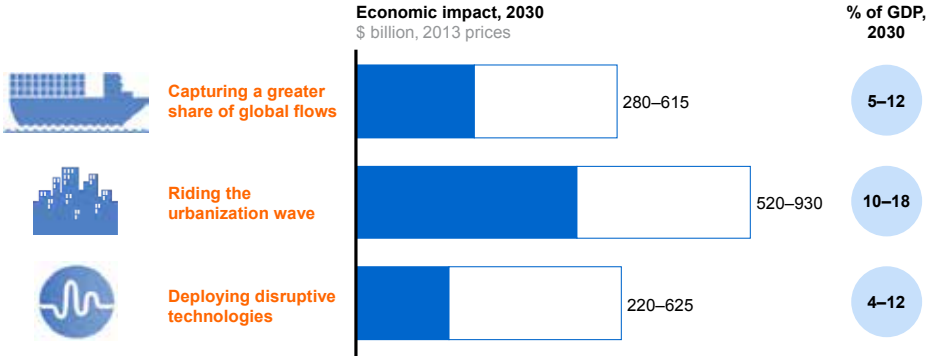
We chose to focus on these three trends after considering a broader set of ideas and evaluating each one for its potential impact in five areas: productivity, inclusiveness, resilience, agility, and connectivity, all of which are fundamental to creating sustainable and broad-based prosperity. In terms of productivity, for example, urbanization creates the critical mass and density necessary to produce economies of scale and network effects; a city with 200,000 people is 3 to 8 percent more productive on average than one with 100,000 residents.[2] Capturing these opportunities could also create more inclusive societies. The investment associated with developing the necessary trade and urban infrastructure alone could create tens of millions of jobs, while new technologies can deliver vital education and health services to more remote areas.

1 These projections are calculated on a total rather than an incremental basis to understand their full effect. This approach was also taken due to difficulty in establishing the baseline impact for each individual lever across ten economies. Each projection is based on dozens of interviews with regional experts and a combination of macroeconomic and industry projections. See the technical appendix for further details.

2 Stuart S. Rosenthal and William C. Strange, "Evidence on the nature and sources of agglomeration economies," in *Handbook of urban and regional economics*, 1st ed., volume 4, J. V. Henderson and J. F. Thisse, eds., Elsevier, 2004.

**Exhibit E2**

**Three economic opportunities have the potential for substantial impact across ASEAN by 2030**




NOTE: These figures are based on a partial-equilibrium analysis that estimates only first-order effects and therefore cannot be summed to calculate the full economic impact. Numbers are rounded to nearest $5 billion.
SOURCE: McKinsey Global Institute analysis

But these trends also pose risks. Deeper participation in international trade ushers in new competitive pressures, and while these are beneficial from a productivity standpoint, they could dislodge current industry leaders. Inequality could deepen as structural change from lower- to higher-productivity sectors accelerates, reducing demand for less-skilled workers. In addition, some of the sectors that are likely to experience rapid growth, such as trade and transport as well as construction, are often associated with vulnerable and informal employment. Technology-driven automation could eliminate some clerical functions or customer service jobs; workers in these roles will need to adapt and learn the skills to carry out higher-value tasks. And without careful urban planning and investment, cities could develop slums, gridlock, and overburdened public services that eventually choke off economic growth rather than enhancing it.

Given the size of the potential prize and the importance of managing the associated risks, these three forces need to move to the center of the region's policy discussions—and businesses need to embed them into their strategic planning. The countries and companies that move quickly to seize the opportunities could secure advantages that last for decades to come. The section below describes how Southeast Asia could harness each of these trends to address its current gaps, deepen the benefits of regional integration, and create new sources of growth for the future.

## Capturing a greater share of global flows

In 2012, the flows of goods, services, and finance across the world's borders reached $26 trillion, or 36 percent of global GDP. That is 1.5 times as large relative to GDP as they were in 1990—and current flows could nearly triple by 2025. MGI research has shown that countries that are more connected within global networks of flows experience larger benefits in terms of GDP growth than countries that are less connected.[3] Southeast Asia has an opportunity to translate this global phenomenon into regional growth.

3 For further details, see *Global flows in a digital age*, McKinsey Global Institute, April 2014. Financial flows cover foreign direct investment, equity, bonds, and loans.

The MGI Connectedness Index sheds light on where each ASEAN country stands in terms of integration into the global economy. It assesses 131 nations, tracking their inflows and outflows of goods, services, finance, people, and data and communication, relative to the size of their economies. Singapore is far and away the region's standout on the index, ranking fourth globally. Four other ASEAN countries also place in the top 50: Malaysia (18), Thailand (36), the Philippines (45), and Vietnam (48). Given its proximity to India, China, and Japan, ASEAN is well positioned to benefit from all types of global flows—and by 2025, more than half of the world's "consuming class" will live within a five-hour flight of Myanmar.[4]

The biggest potential for Southeast Asia in the near term is capturing a larger share of the world's trade in goods and services. To date, exports have played a smaller role than consumption and investment in driving GDP growth in many ASEAN countries. However, two major developments are creating a unique window of opportunity to increase exports. First, the region's cross-border flows will deepen and accelerate if the ambitious ASEAN Economic Community (AEC) integration plan is successfully implemented. The AEC, which envisions the freer movement of goods, services, capital, and people among member states, is becoming a working reality and creating an open market of 600 million consumers. Second, as China's labor costs continue to rise, multinational companies will look for new production sites. This represents an opening for ASEAN member states to establish themselves as bigger hubs of manufacturing.

Together these opportunities could be worth $280 billion to $615 billion by 2030, which is equivalent to almost 12 percent of the region's projected GDP in that year.[5] This expansion of manufacturing and trade could provide a significant boost to employment and living standards. One study suggested that AEC integration could add 14 million jobs to six ASEAN economies (Cambodia, Indonesia, Laos, the Philippines, Thailand, and Vietnam) by 2025.[6]

Integration can accelerate the flow of trade and encourage companies to enter new markets. Removing many of the inefficiencies associated with exporting could lower the prices of goods and services as well as enabling retailers to stock a broader range of merchandise. This could spur new consumption across Southeast Asia, leading to a virtuous cycle of growth. In addition, improved logistics networks (in terms of both cost and efficiency) will speed time to market and allow companies to be more nimble in responding to new demand. Our analysis finds that greater integration could produce productivity benefits worth up to 20 percent of the cost base in many sectors. While it could intensify competition, creating new winners and losers across the region, it can unlock new demand and create substantial consumer surplus.

In 2007, ASEAN member states committed to accelerating AEC implementation with the goal of forming a single market and production base by 2015. A new MGI assessment measuring progress on the ground reveals that no sector

4 Defined as households with more than $7,500 in annual income (in 2005 purchasing power parity terms).

5 Based on estimates in the academic literature of the economic impact from ASEAN concluding bilateral free trade agreements with the United States, Europe, and other key Asia-Pacific countries in addition to AEC integration. See Peter A. Petri, Michael G. Plummer, and Fan Zhai, "The ASEAN Economic Community: A general equilibrium analysis," *Asian Economic Journal*, volume 26, number 2, June 2012.

6 *ASEAN Community 2015: Managing integration for better jobs and shared prosperity*, Asian Development Bank and the International Labour Organisation, August 2014.

today is fully integrated across all the dimensions that matter for cross-border operations. However, while full integration appears highly unlikely by the target date of 2015, there has been real progress. The most notable step forward has been the near elimination of tariffs. Average tariff rates in the original five member states (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) have been virtually zero since 2010. But other types of barriers are falling more slowly. MGI conducted a survey of regional businesses, and respondents cited restrictions on foreign investment and ownership as the biggest barriers to trade, followed by standards and regulations that vary between countries and inefficient customs procedures. Integration is proceeding faster for traded goods (particularly automotive, textiles, and wood) than for services (such as finance and health care).

Two factors seem to be important for creating momentum. First is the mindset of business leaders. In some sectors, integration is clearly perceived as a "win-win," and local stakeholders are not resisting change. The second is whether key companies in a given sector are willing to devote resources to working with governments to drive the process forward. In the cosmetics industry, for example, L'Oréal actively participated in four years of groundwork by the ASEAN Consultative Committee on Standards and Quality to produce a harmonized regulatory scheme that reduces technical barriers to trade. Governments play a fundamental role in setting the conditions that either enhance or constrain the flow of goods and services, and their engagement is crucial to removing legislative and regulatory barriers.

The transitions taking place in China—including rising labor costs and the shift toward an economic model that is less reliant on exports—are creating ripple effects in Southeast Asia. ASEAN has a window of opportunity to capture a greater share of global manufacturing, especially from multinationals that are seeking a lower cost base or are simply daunted by the challenges of doing business in China. The availability of low-cost labor in Cambodia, Indonesia, Laos, Myanmar, and Vietnam can be a competitive advantage. Average costs for factory labor are about $7 a day in Vietnam and $9 in Indonesia, far less than the $28 average in China (which has posted a 19 percent compound annual growth rate in wages since 2007).

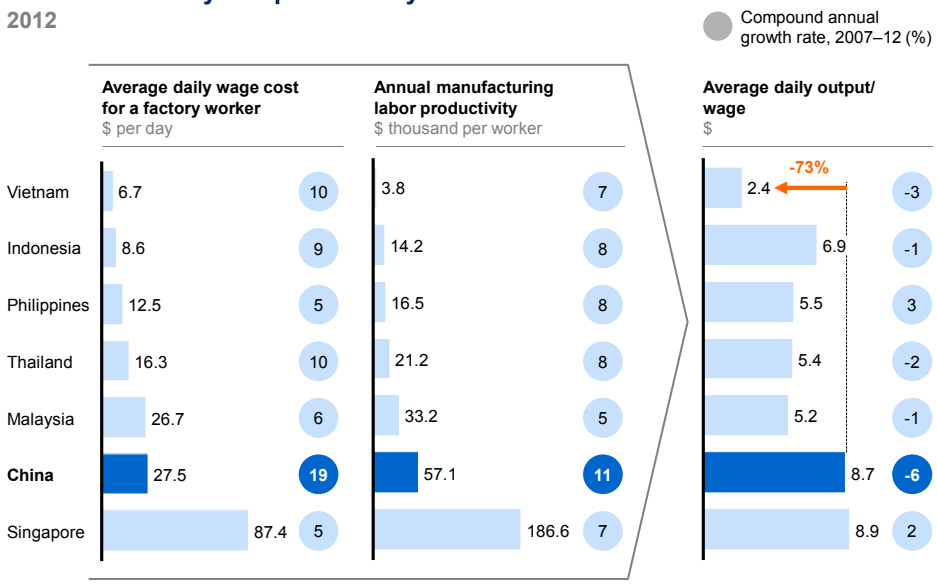
However, the advantage of low labor costs in these countries is undermined by weak output per worker. In 2012, average labor productivity in Vietnam's manufacturing sector was only about 7 percent of that in China (Exhibit E3). Southeast Asia's lower-income countries will have to grapple with their productivity challenges in order to lift the wages of factory workers in the future while remaining competitive.

Turning ASEAN into a unified powerhouse of manufacturing and trade will require both public and private efforts. On the policy side, the first step is increasing awareness of ASEAN and the AEC among the business community and the broader public alike. Focusing on removing a handful of key administrative barriers that are important to businesses could release significant value and go a long way toward illustrating the benefits of integration. The ASEAN Secretariat also needs additional resources to manage and monitor the integration process.

**Exhibit E3**

**ASEAN's labor costs are lower than China's, but this competitive advantage is undermined by low productivity**

2012




NOTE: Brunei, Cambodia, Laos, and Myanmar not included due to lack of available data. Analysis assumes Monday-Friday work and 4 weeks off work per year for all countries (combination of leave allowances and public holidays).

SOURCE: IHS; Statistics Indonesia; Bank of Thailand; Department of Statistics Malaysia; SingStat; Philippines Statistics Authority; General Statistics Office Vietnam; National Bureau of Statistics of China; Ministry of Human Resources Malaysia; McKinsey Global Institute analysis

If the region hopes to maximize the benefits of integration by expanding manufacturing, it will need to maintain macroeconomic and political stability, build world-class infrastructure, and intensify its focus on workforce skills. Becoming the location of choice for multinationals will involve creating the right set of incentives, improving the ease of doing business, loosening foreign investment restrictions, and establishing effective government agencies for marketing.

Small and medium-sized enterprises (SMEs) play an outsized role in the region's economy; ensuring that they have greater access to financing will position them to scale up. Our survey and interviews reveal that many companies have not incorporated integration or emerging trade deals into their strategies. But staking out a position early as markets start to open and fully utilizing existing trade frameworks can make all the difference in whether companies are able to turn integration into a growth opportunity.

As a regional grouping, ASEAN does not have the deep institutional ties and infrastructure links that bind together the European Union. Nor has it built the kind of seamless supply chains that funnel massive trade flows through North America. But the region does have strong momentum and enormous potential. If it can build the right underpinnings and make integration work on the ground, ASEAN could accelerate productivity growth by overcoming some of the fragmentation that has prevented companies, technologies, and services from achieving scale in the past.

## Riding the urbanization wave

The rise of cities has gone hand in hand with strong economic growth in China, India, and elsewhere in the developing world, and similar forces are at work across Southeast Asia. Today just over one-third of the region's population lives in cities that account for two-thirds of the region's GDP. This expansion shows no sign of slowing: by 2030, we expect that these cities will attract more than an additional 90 million people and bring the urban share to almost 45 percent of the population and 76 percent of GDP. The economic and societal changes associated with this shift will reverberate for years to come. By 2030, the continued growth of cities could add $520 billion to $930 billion to the region's GDP.

Urbanization is a major driver of economic growth. In fact, no country has ever climbed from low-income to middle-income status without a significant population shift into cities. This reflects several factors, starting with the job mix effect. As people leave behind farms for urban jobs, they become more productive and earn higher wages. In Malaysia, for example, real GDP per capita at purchasing power parity grew 3.4 percent annually from 1990 to 2010 as the urban share of the population increased from 50 percent to 72 percent. Cities give businesses access to a broader base of customers, suppliers, and capital, and they are magnets for talent, including workers with greater levels of skills and education. Additionally, previous MGI research has found that it is up to 50 percent cheaper to deliver a number of basic services, such as piped water, to dense urban areas than to sparsely populated areas.[7]

Already some 81 million households in ASEAN states are part of the "consuming class," with incomes exceeding the level at which they can begin to make significant discretionary purchases.[8] As huge populations continue to move to cities for better job opportunities, that number could double to 163 million households by 2030. This dramatic income shift will spur demand for a wide range of goods and services.

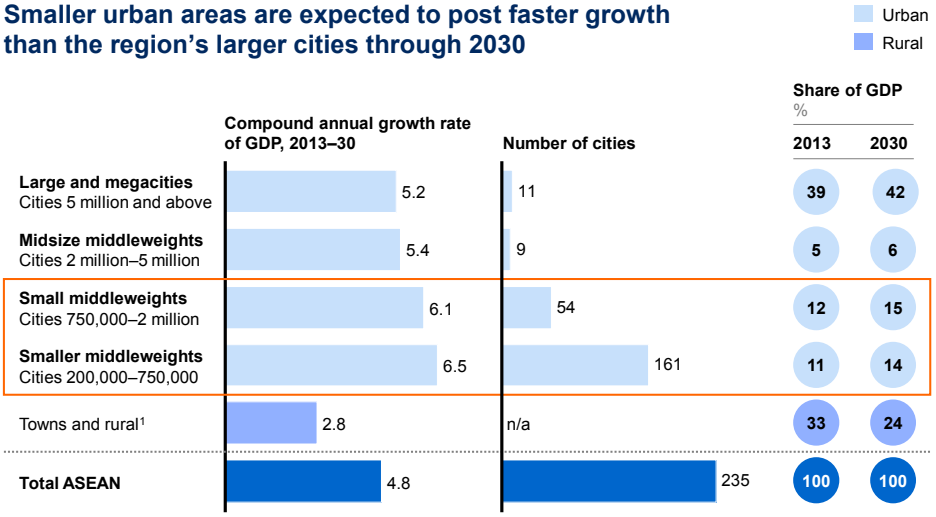
To capture this opportunity, consumer-facing companies need to craft strategies for navigating a fragmented wholesale and retail environment. New players will need to manage distributors effectively and take a city-level, rather than a national, view of markets—especially since many of the fastest-growing consumer markets are smaller up-and-coming cities (Exhibit E4). For example, we forecast that Cebu (in the Philippines) could be the fourth-largest market among ASEAN cities for detergent in 2030, Khon Kaen (in Thailand) could be the sixth-largest market for facial moisturizer, and Bekasi (in Indonesia) could be the sixth-largest market for diapers. Southeast Asia could be fertile ground for a wave of innovation—not only in consumer goods, but also in industrial goods and the services demanded by a more urban economy.

7 *Urban world: Cities and the rise of the consuming class*, McKinsey Global Institute, June 2012.

8 Defined as households with more than $7,500 in annual income (in 2005 purchasing power parity terms).

**Exhibit E4**

**Smaller urban areas are expected to post faster growth than the region's larger cities through 2030**




1 Includes cities with fewer than 200,000 inhabitants.
NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute Cityscope database; national statistics offices; McKinsey Global Institute analysis

Beyond the growth in consumption, this wave of urbanization calls for major infrastructure investment. Recent MGI research shows that with a few exceptions such as Japan, the value of infrastructure stock (excluding housing) in most economies averages around 70 percent of GDP.[9] But most of Southeast Asia falls well short of that level today. ASEAN member states will need to sharply increase their historical investment in order to reach and then maintain this benchmark of infrastructure stock to GDP as their economies grow. On top of building out the necessary water, power, sanitation, transportation, and communications systems, they will have to invest heavily in new housing and commercial space. Considering the region's infrastructure and real estate needs together brings the required cumulative investment to $7 trillion by 2030—an amount that is roughly double Germany's current GDP.

Undertaking this investment will be critical to determining whether cities develop in a livable and sustainable way. With multiple infrastructure needs competing for scarce resources, governments cannot afford the delays and spiraling costs that accompany too many large-scale projects. A relentless focus on making investment more productive could either reduce the capital that is required or deliver additional assets for the same amount spent. Past MGI research has found opportunities to reduce the cost of infrastructure by around 40 percent through better project selection, more efficient delivery, and strategies to maximize the life span and capacity of existing infrastructure. In addition, strong oversight and a robust financing framework are necessary to capture this savings.[10] Long-term urban planning will have to focus on resilient infrastructure to account for Southeast Asia's acute vulnerability to climate change.

Addressing infrastructure is only one aspect of planning and managing vibrant cities that can simultaneously deliver economic growth and a high quality of life. Another top priority for policy makers will be establishing affordable housing

9 *Infrastructure productivity: How to save $1 trillion a year*, McKinsey Global Institute, January 2013.

10 Ibid.

programs to absorb the expected wave of new urban migrants. Education and health-care services will need to be expanded so that inequality does not worsen. Eliminating corruption and improving governance is another ongoing challenge. Technology can provide effective new tools that help cities engage citizens, streamline service delivery, and manage complex infrastructure systems.

## Deploying disruptive technologies

Much of ASEAN (with the notable exception of Singapore) is starting from a relatively low base in terms of digital infrastructure, adoption, and innovation. But this picture is beginning to change rapidly: from 2008 to 2013, the number of Internet users grew at a brisk 16 percent annually.[11] If the region can put the necessary backbone infrastructure in place, it could harness the power of technology to drive productivity improvements. Furthermore, ASEAN's starting point implies that it has a larger opportunity for technology-driven growth than more developed regions, with possibilities for digital leapfrogging in multiple areas. Most countries across the region have low penetration of landline phones and fixed-line broadband Internet, for instance, but they are bypassing these stages altogether in favor of the mobile Internet. In remote regions that have not built out traditional brick-and-mortar retail stores, shoppers may flock straight to e-commerce.

Five closely related digital technologies are poised to create substantial economic growth and societal change across multiple sectors and the entire region in the years ahead:

- **The mobile Internet.** The mobile Internet can pave the way for productivity gains and more efficient delivery of vital services. It is a particularly useful vehicle for overcoming Southeast Asia's geographical barriers and widening access to information, products, and services for rural populations. Mobile banking and mobile payments, for example, are expanding financial inclusion. Similarly, telemedicine can deliver health care to remote areas, and digital learning tools can improve the quality of education and teacher training across the region.

- **Big data.** The ability to analyze huge volumes of data, extract insights, and act on them in close to real time could be a source of advantage as Southeast Asia's newly prosperous middle class begins to flex its purchasing power. To better cater to consumers, companies will need to understand increasingly granular micro-segments of their markets. Big data analytics also offers financial institutions more sophisticated risk-management capabilities and allows the public sector to improve functions ranging from tax collection and procurement to disaster response. Sharing electronic medical records and analyzing patient data could lead to more effective administration of health-care services. Many ASEAN countries, however, are at a low starting point regarding data collection and usage. This underscores the substantial effort and commitment required for big data analytics to take flight, but it also highlights the large upside potential.

11 *World development indicators*, World Bank, 2014.

- **The Internet of Things.** The Internet of Things refers to networks of sensors and actuators embedded in machines and other physical objects that connect with one another and the Internet. Radio frequency identification (RFID) tags on containers and boxes, for example, can track products as they move through warehouses and transportation hubs to store shelves, allowing companies to tighten their supply chain to avoid stock-outs, excess inventory, and losses. GPS-enabled telematics can manage fleets and distribution networks in real time—a particularly important capability across Southeast Asia, where supply chains are highly fragmented. Similarly, smart storage and tracking systems in the agricultural supply chain can reduce food spoilage and waste by tracking container availability and temperatures. The Internet of Things can also monitor and manage complex infrastructure. Thailand's water authority, for example, is implementing a system to consolidate data across all of its regional water systems to track supply, losses, customer use, and water levels during flooding.

- **The automation of knowledge work.** Advances in artificial intelligence, machine learning, and natural user interfaces (such as voice recognition) are making it possible to automate many tasks long regarded as impossible or impractical for machines to perform. This breakthrough could have significant benefits for Southeast Asia given its localized shortages of skilled labor; it can go a long way toward filling in gaps or empowering workers with less training to achieve greater impact. Education systems, for example, can support overstretched teachers by employing algorithms that evaluate student performance and suggest specific points for greater classroom focus.

- **Cloud technology.** As the costs of cloud computing come down, companies across the region will gain pay-as-you-go access to secure storage and infrastructure services, basic software, and enterprise systems. Many small firms have limited access to IT services today, but cloud technology can give them new productivity tools without forcing them to tie up capital in IT systems that could quickly become obsolete. Advances in cloud computing will also reduce the costs associated with storing and analyzing big data. Singapore, for example, is creating the "H-Cloud," which will host all mission-critical systems for public hospitals, specialty centers, and polyclinics that are part of its Integrated Health Information Systems. This consolidation will save costs and pool information that could be analyzed to provide more efficient and effective patient treatment.

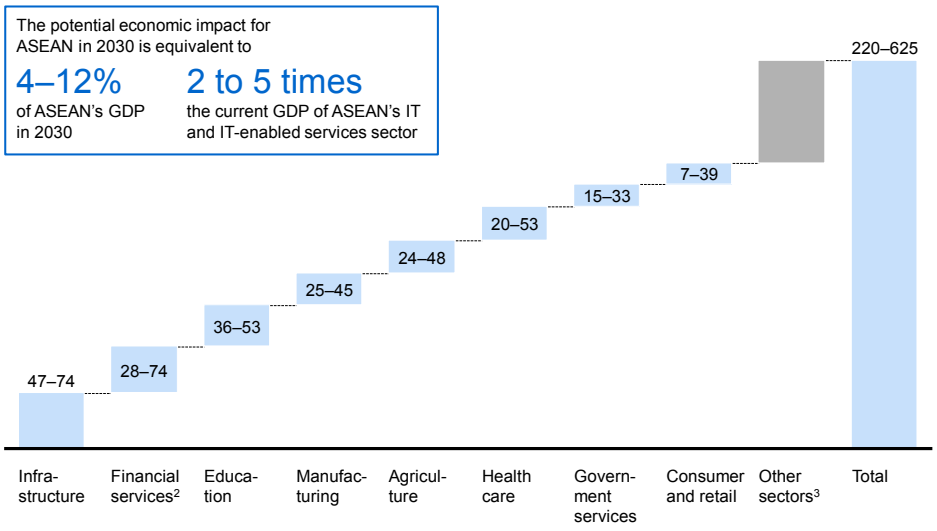
Together, these five disruptive technologies (along with several other sector-specific innovations such as 5D building information modeling to optimize infrastructure design, advanced genomics in agriculture and health care, and 3D printing in the consumer and retail sector) have the potential to unleash some $220 billion to $625 billion in annual economic impact by 2030. Within many sectors, there is large value at stake for companies that move quickly to digitize their operations and carve out competitive positions early. More broadly, these technologies can generate consumer surplus and enable governments to deliver public services more efficiently (Exhibit E5).

**Exhibit E5**

**Disruptive technologies have significant potential across key sectors in ASEAN economies**

**Potential annual economic impact in ASEAN[1]**

$ billion, 2030




1 These estimates do not represent GDP or market size (revenue), but rather economic potential, including consumer surplus. See the technical appendix for further explanation.
2 Includes $17 billion–$52 billion of sector-related impact from sector-related effects such as greater financial inclusion.
3 Additional sectors represent 25–30 percent of ASEAN's total GDP. Impact estimate based on top-down estimate of disruptive technologies.

SOURCE: McKinsey Global Institute analysis

Disruptive technologies could accelerate the region's growth and progress—and not just for its higher-income economies. The region's less developed countries have already displayed an enormous appetite for new technology: mobile penetration rates in Vietnam, Laos, and Cambodia went from less than 5 percent to more than 70 percent in less than a decade.[12]

To capture this opportunity, however, policy makers will need to prioritize building the backbone infrastructure (including fiber connections and mobile networks) that can provide universal and low-cost Internet access. As private players are unlikely to undertake the full scope of this build-out, governments will have to drive this effort forward; those that do could secure a deep and lasting advantage. Additional challenges include establishing a policy framework for data sharing, online privacy, and cybersecurity as well as supporting SMEs in technology adoption.

Technology is likely to cause some disruption in the labor market as supply chains and assembly lines are automated, e-commerce supplants traditional brick-and-mortar stores, and next-generation construction methods are adopted. In all, 6 to 8 percent of ASEAN's total non-farm labor force in 2030—or 12 million to 17 million workers in non-farm jobs—could be displaced by technology, and

12 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

governments will have to ensure that they have access to support and retraining.[13] Education systems will need to emphasize the skills required in a more digital economy, focusing broadly on digital literacy and English proficiency while also cultivating enough deep analytical talent.

There is considerable overlap between the business agenda and the public policy agenda for technology adoption. Companies will need to work closely with governments on issues of skills, standards, and infrastructure. Large businesses and SMEs alike need to put management focus, time, effort, and capital into technology if they hope to stay ahead of the curve. One of their first challenges will be securing the right mix of skills and integrating their tech talent into all processes. In the longer term, they can develop talent by training existing employees or partnering with education providers. Businesses from all sectors will need to set up safeguards throughout their operations to protect customer data.

□ □ □

By focusing on global trade, urbanization, and disruptive technologies as drivers of future growth, Southeast Asia could be poised to make a leap forward in economic development. In all three of these areas, long-term thinking and investment by both the public and private sectors could create immediate economic impact while placing the region on a faster and more sustainable trajectory through 2030. If it is successful at harnessing these opportunities and transforming itself into a seamless regional market and production base, ASEAN could emerge alongside China and India as an economic powerhouse.

13 In addition to the five disruptive technologies profiled in this report, this analysis includes others that could have a significant impact on jobs due to productivity gains. For example, in construction, we also consider next-generation construction methods such as prefabrication. While we have not included the impact on farming jobs, technologies such as precision farming could also improve productivity in this sector.

# 1. Harnessing global trends for regional growth

"I never think of the future," Albert Einstein once observed. "It comes soon enough." Most business leaders and policy makers similarly spend little time considering broader forces they cannot shape directly, such as demographic trends, advances in technology, or urbanization. But they can prepare for these changes—or even better, respond early to the opportunities they represent.

This has particular relevance today in the Association of Southeast Asian Nations (ASEAN). This coalition of ten remarkably diverse member states (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam) has embarked on an ambitious project to create a more unified economic community with deeper economic ties—one that can assume a more formidable scale in the global economy.

There are wide disparities among member states (Exhibit 1). Indonesia represents more than one-third of the region's economic output and is a member of the G-20, while Myanmar, emerging from decades of isolation, is still a frontier market working to build its institutional framework. Singapore's GDP per capita is more than 30 times that of Laos and over 50 times the GDP per capita of Cambodia or Myanmar; in fact, it even surpasses that of mature economies such as the United States and Canada. The standard deviation in average incomes among ASEAN countries is more than seven times that of EU member states.

That diversity extends to political systems, culture, language, and religion. ASEAN has adopted English as the official language of business and administration, but hundreds of languages are spoken across the region. English is an official language in Singapore and the Philippines, but Thailand places near the bottom of one international ranking of English proficiency.[14] Indonesia is almost 90 percent Muslim, while the Philippines is more than 80 percent Roman Catholic and Thailand is more than 95 percent Buddhist.[15]

But Southeast Asia is united by multiple threads of history and culture and common geopolitical concerns. Today it is also increasingly tied together by business networks, trade relationships, migration, and shared resources. Now, almost five decades after the organization's founding, ASEAN is building a new agenda for regional integration that can provide a foundation for broader prosperity and greater global competitiveness (see Box 1, "The AEC and a new vision for integration").

14 Education First English Proficiency Index, 3rd ed., www.ef.edu/epi/.

15 *The world factbook*, US Central Intelligence Agency.

Exhibit 1

## ASEAN has large disparities in economic development


| | Year of entry into ASEAN | Population Million | GDP[1] $ billion | GDP per capita[1] % of US level | Real growth of GDP, 2003–13 % |
|---|---|---|---|---|---|
| Brunei | 1984 | 0.4 | 17 | 78 | 1.1 |
| Cambodia | 1999 | 15.1 | 15.5 | 2 | 7.8 |
| Indonesia | 1967 | 249.9 | 868.3 | 7 | 5.8 |
| Laos | 1997 | 6.8 | 10.9 | 3 | 7.8 |
| Malaysia | 1967 | 29.7 | 312.4 | 20 | 5 |
| Myanmar | 1997 | 62.8 | 59 | 2 | 8.6 |
| Philippines | 1967 | 98.4 | 272 | 5 | 5.4 |
| Singapore | 1967 | 5.4 | 295.7 | 103 | 6.3 |
| Thailand | 1967 | 67 | 387.2 | 11 | 3.8 |
| Vietnam | 1995 | 91.7 | 171.2 | 4 | 6.4 |

1 2013, in current prices.
SOURCE: IHS; McKinsey Global Institute analysis

### Box 1. The AEC and a new vision for integration

The Association of Southeast Asian Nations (ASEAN) was formed in 1967 by Indonesia, Malaysia, the Philippines, Singapore, and Thailand, with the aim of driving regional political and economic collaboration. The organization has since expanded to ten countries, adding Brunei, Cambodia, Laos, Myanmar, and Vietnam. Economic integration has been a core goal for ASEAN since its founding, and over the decades, member states have taken gradual steps to remove the barriers between them.

In 2003, regional officials agreed to a set of initiatives designed to better capture the region's potential and position it to compete with Asia's largest economies. They outlined three "pillars": the ASEAN Political-Security Community, the ASEAN Economic Community (AEC), and the ASEAN Socio-Cultural Community. In 2007, members committed to accelerating formation of the AEC, aiming to complete it by 2015 (with extensions granted to Cambodia, Laos, Myanmar, and Vietnam). Our analysis in Chapter 2 shows that the integration process is still far from complete. But if ASEAN countries can make meaningful progress on the major barriers that remain (such as differing product standards, inefficient customs procedures, and investment restrictions), the region could overcome some of the fragmentation that has long prevented companies, technologies, and services from achieving scale.

The AEC is premised on the free flow of goods, services, labor, and investment. It aims to create four important components: a single market and production base, a highly competitive economic region, a region of equitable economic development, and a region fully integrated into the global economy. ASEAN's commitment to the AEC represents high aspirations for integration. What started as a straightforward push merely to lower formal trade barriers has evolved into a vision for a dynamic and unified market—one that has the potential to compete head-to-head with the world's biggest economies.[1] The broad economic trends explored in this report raise specific new opportunities to build digital networks, connected infrastructure, and deeper trade ties—all of which expand the possibilities for what ASEAN can achieve as a whole.

1 *ASEAN economic community: Potential, reality, and the role for business*, Vriens and Partners, May 2014.

To reach the next level of economic development, however, the region will have to overcome some major hurdles. Although ASEAN has posted robust economic growth since 2000, most member states continue to lag in productivity performance. While productivity has been rising in recent decades, a substantial share of these gains has been driven by a broad shift of labor from agriculture into more efficient sectors, rather than improvements in productivity within sectors. The region has also been able to rely on workforce expansion to generate growth, but its favorable demographics will begin to taper in the years ahead.

Southeast Asia can address many of these challenges by carving out its own unique opportunities from three global megatrends: expanding cross-border trade, unprecedented urbanization, and the advent of multiple disruptive technologies. These forces are already reshaping the region's landscape. But if policy makers and businesses recognize the opportunities associated with these trends and create strategies to capture them, the results could be transformative.

In a more deeply interconnected global economy, ASEAN will have to act decisively to capture its share of the growth associated with these trends—or risk being left behind. The region could miss out on the opportunity to secure more production from multinationals unless it successfully transforms itself into a streamlined trading community with a competitive manufacturing sector supported by modern infrastructure. Given the size of the potential prize and the importance of managing the associated risks, these three forces need to move to the center of the region's policy discussions. Businesses need to embed

them into their strategic planning and move quickly to take advantage of new market openings.

Southeast Asia has a rare window of opportunity to harness these three trends as catalysts for growth. The acceleration of global flows, the urbanization wave, and disruptive technologies represent enormous transformations for the global economy. If the region's leaders can respond to them with vision and agility, ASEAN could add hundreds of billions of dollars to its annual GDP by 2030. Equally important, it could produce more livable cities, more inclusive growth, and a stronger and more diversified position in world trade.

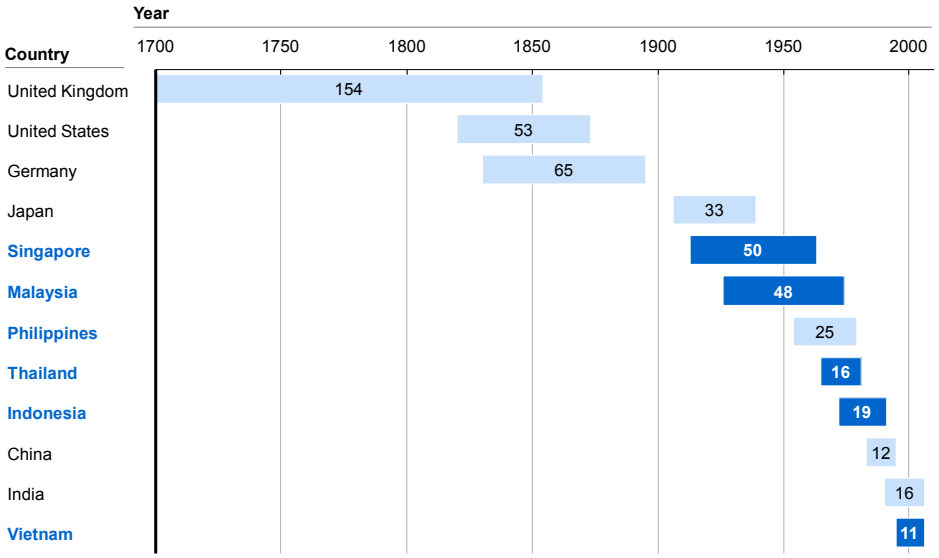
## ASEAN NEEDS THE RIGHT SET OF CATALYSTS TO REACH THE NEXT LEVEL OF ECONOMIC DEVELOPMENT

ASEAN has experienced significant growth over the past 20 years, with incomes rising at an unprecedented rate. Individual member states have managed to double per capita GDP in anywhere from 11 to 50 years, far faster than the United Kingdom, which required 154 years to achieve the same level of growth (Exhibit 2).

**Exhibit 2**

**Incomes in ASEAN countries are rising at unprecedented rates**

**Years to double per capita GDP[1]**




1 Time to increase per capita GDP (in PPP terms) from $1,300 to $2,600.
SOURCE: Angus Maddison, *Historical statistics of the world economy: 1–2008 AD*; McKinsey Global Institute analysis

This rapid growth has transformed the region, lifting millions out of poverty. Consider the numbers: if ASEAN were a single country, it would already be the seventh-largest economy in the world, with a combined GDP of $2.4 trillion in 2013. It is projected to rank as the world's fourth-largest economy by 2050.[16] The region proved remarkably resilient in the aftermath of the 2008 global financial crisis, and today government debt is less than 50 percent of GDP, far lower than the levels in many developed economies (Exhibit 3). In fact, ASEAN has experienced much lower volatility in economic growth since 2000 than the European Union.

16 Based on forecasts by IHS.

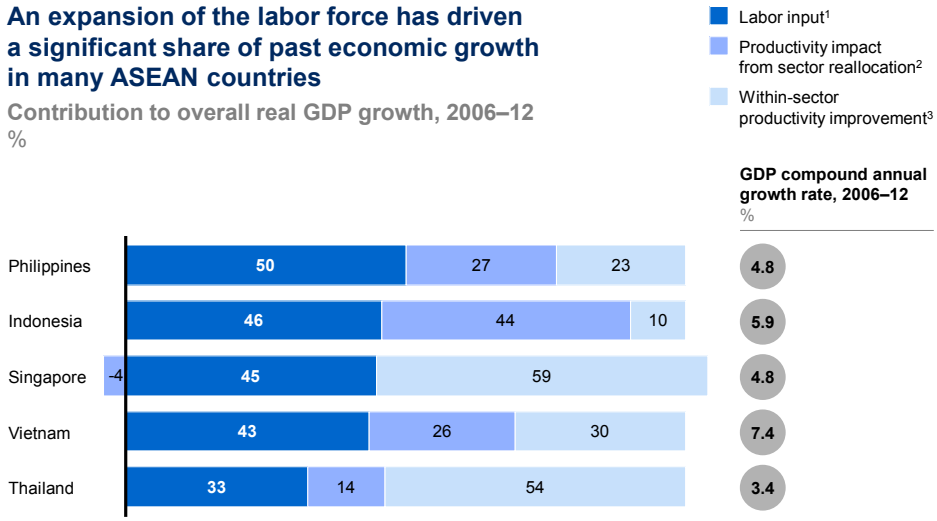
GDP growth can be driven by an expansion of the labor force and by productivity—and ASEAN is firing on both of these cylinders. Home to more than 600 million people, it has a larger total population than the European Union or North America. ASEAN has the third-largest labor force in the world, behind only China and India, and its youthful population is producing a demographic dividend. Perhaps most important, almost 60 percent of total growth since 1990 has been driven by productivity gains, as sectors such as manufacturing, retail, telecommunications, and transportation have grown more efficient.[17] However, the contribution of each of these factors varies significantly by country (Exhibit 4).

## Exhibit 3
### ASEAN has experienced rapid growth and relative stability since 2000

| GDP 2013, current prices $ trillion | | Real GDP growth, 2000–13 % | | GDP growth volatility, 2000–13[1] % | | Share of debt to GDP, 2013 % | | Inflation rate, 2013 GDP deflator, % | |
|---|---|---|---|---|---|---|---|---|---|
| United States | 16.8 | China | 10.0 | Russia | 4.2 | Japan | 243.2 | India | 7.0 |
| China | 9.3 | India | 7.0 | India | 2.4 | Italy | 132.5 | Russia | 6.5 |
| Japan | 4.9 | **ASEAN** | **5.1** | United Kingdom | 2.3 | United States | 104.5 | Brazil | 6.5 |
| Germany | 3.6 | Russia | 4.4 | Italy | 2.3 | France | 93.9 | **ASEAN** | **2.8** |
| France | 2.7 | Brazil | 3.2 | Germany | 2.3 | United Kingdom | 90.1 | Germany | 2.3 |
| United Kingdom | 2.5 | Canada | 1.9 | Japan | 2.2 | Canada | 89.1 | United Kingdom | 2.1 |
| **ASEAN** | **2.4** | United States | 1.8 | Brazil | 2.2 | Germany | 78.1 | China | 1.7 |
| Brazil | 2.2 | United Kingdom | 1.5 | China | 1.8 | India | 66.7 | United States | 1.5 |
| Russia | 2.1 | Germany | 1.1 | United States | 1.7 | Brazil | 66.3 | Canada | 1.5 |
| Italy | 2.1 | France | 1.0 | Canada | 1.7 | **ASEAN** | **46.7** | Italy | 1.4 |
| India | 1.9 | Japan | 0.8 | France | 1.6 | China | 22.4 | France | 1.1 |
| Canada | 1.8 | Italy | 0.0 | **ASEAN** | **1.5** | Russia | 13.4 | Japan | -0.6 |

1 Standard deviation of GDP growth rate.
SOURCE: IHS; *World economic outlook,* International Monetary Fund, April 2014; McKinsey Global Institute analysis

## Exhibit 4
### An expansion of the labor force has driven a significant share of past economic growth in many ASEAN countries
Contribution to overall real GDP growth, 2006–12
%




1 Reflects changes in employment, labor force participation, and working-age population.
2 Sector reallocation impact reflects the change in employment share between sectors and the differences in their 2006 productivity levels.
3 Reflects the growth impact from productivity improvements within each sector.
NOTE: Some ASEAN countries (Brunei, Cambodia, Laos, and Myanmar) were excluded due to lack of sector-level employment data. Malaysia was excluded as informal labor was included in the latest employment numbers, which skews the results. Numbers may not sum due to rounding.
SOURCE: IHS; Statistics Indonesia; Bank of Thailand; Department of Statistics Malaysia; Singapore Statistics; Philippines Statistics Authority; General Statistics Office Vietnam; McKinsey Global Institute analysis

17 *Understanding ASEAN: Seven things you need to know*, McKinsey & Company, May 2014.

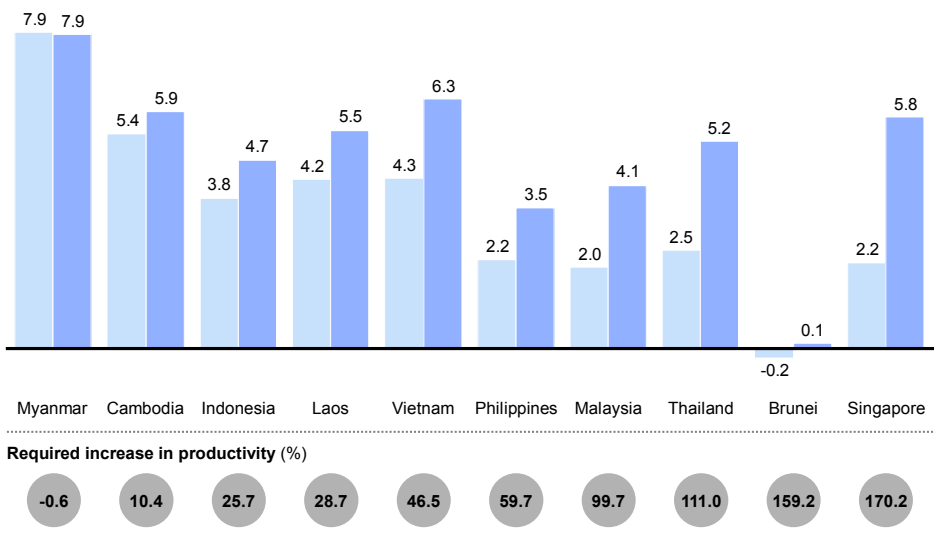
While this strong productivity growth is encouraging, a substantial share of it has been driven by the shift of labor out of lower-productivity rural farming into urban jobs. In the case of Indonesia and the Philippines, for instance, the changing sector mix accounts for more than half of the productivity growth posted from 2006 to 2012, with the remainder driven by productivity improvements within sectors. And despite the upward trend line, overall productivity levels remain low across much of the region. Excluding Singapore and Brunei, average labor productivity in ASEAN countries is still approximately 40 percent lower than in China.

After two decades of robust growth, ASEAN has now reached an inflection point. Its member states could find themselves struggling to build on the initial momentum caused by the shift from agriculture to urban employment. In addition, while the demographics are still favorable in most ASEAN countries, the boost to economic growth derived from rising numbers of young people entering the workforce will eventually abate. In fact, some countries will need to more than double the pace of historic productivity gains to sustain economic growth rates (Exhibit 5). This will prove to be challenging, as much of the "low-hanging fruit" has already been harvested in the first wave of industry modernization. It will take a concerted effort to implement deeper efficiency improvements that can make individual sectors globally competitive. The good news is that the three major forces explored in this report present multiple opportunities to further this goal through such means as streamlining the regulatory environment, building foundational infrastructure, and encouraging businesses to digitize.

**Exhibit 5**

**Most ASEAN countries will need to make sharp improvements in labor productivity to maintain historical growth rates**

Annual labor productivity compound annual growth rate
%




1 Assuming that working-age population evolves according to estimates provided by the United Nations, with constant labor participation and employment rates.

NOTE: Numbers may not sum due to rounding.

SOURCE: IHS; United Nations; World Bank; McKinsey Global Institute analysis

ASEAN faces other challenges in reaching the next stage of development. As populations continue to swell in the region's cities, urban problems that are not addressed now could become more entrenched. Existing disparities could widen unless the region focuses on building infrastructure and housing, expanding access to public services, and improving education. These factors could constrain the region's potential—unless ASEAN identifies catalysts that can provide new sources of momentum.

## THREE ECONOMIC TRENDS ARE TRANSFORMING SOUTHEAST ASIA

We chose to focus on three major trends after considering a broader set of ideas and evaluating each one for its potential impact in five areas: productivity, inclusiveness, resilience, agility, and connectivity. These factors are fundamental to creating sustainable and broad-based prosperity, and they are critical to Southeast Asia's economic and human development.

In narrowing down our selection, we also looked for catalysts with relevance across a range of sectors and countries within ASEAN. This criterion caused some possibilities to fall out of contention. In the case of unconventional oil and gas, for instance, the timeline for substantial impact extends beyond 2030, and the reserves are disproportionately concentrated in Indonesia.

To determine the potential of various catalysts for Southeast Asia, we conducted dozens of interviews with experts from across the region and created a combination of macroeconomic and industry projections. The three economic opportunities below emerged from this analysis as having the greatest potential to address the region's productivity imperative, raise GDP, generate jobs, and raise living standards across the ASEAN economies by 2030.

- **Linking into global flows.** The web of economic connections among countries and regions is growing ever larger and more complex—not only in terms of goods and capital, but also for exchanges of services, people, data, and communication. MGI's research has shown that countries that are more connected within global networks experience faster GDP growth. ASEAN has key advantages in this regard: it is already the fourth-largest exporting region in the world, and it is strategically located near China, India, and Japan. In fact, by 2025, more than half of the world's consuming class will live within a five-hour flight of Myanmar. The region can build on these strengths in two ways. First, successful implementation of the ASEAN Economic Community integration plan could significantly increase intra-regional trade. Second, there is an opportunity to expand free trade agreements and capture additional production as labor costs in China continue to rise. To capitalize on these openings, ASEAN will need to tackle restrictions on foreign investment and build a more competitive manufacturing sector as well as critical foundations such as infrastructure, logistics, and workforce skills. It will also need to transition to higher-value-added activities.

- **Riding the urbanization wave.** The booming cities of ASEAN account for more than 65 percent of the region's GDP today.[18] More than 90 million people are expected to move to urban areas by 2030, and this shift will support rising incomes. Some 81 million households in ASEAN states are already part of the consuming class, with incomes exceeding the level at which they can begin to make significant discretionary purchases.[19] That number could double to 163 million households by 2030, making ASEAN a pivotal market of the future for companies in a range of industries. Keeping pace with this growth will demand more than $7 trillion of investment in core infrastructure, housing, and commercial real estate across ASEAN through 2030.

- **Deploying disruptive technologies.** With mobile phone penetration of 110 percent and the number of Internet users increasing at 16 percent annually, ASEAN is rapidly going digital. Its member states make up the world's second-largest community of Facebook users, behind only the United States. But there are vast differences in digital infrastructure, capabilities, and usage across the region. One index that assesses countries around the world for the quality of their digital environments ranks Singapore second in the world, while Myanmar ranks 146th out of 148 economies.[20] Capturing the upside from new technologies will require addressing barriers such as gaps in backbone Internet infrastructure, regulatory inconsistencies, and shortages of technical skills. If the public and private sectors can accomplish this, five closely related digital technologies are poised to create substantial economic growth and societal change across multiple sectors and the entire region in the years ahead: the mobile Internet, big data, the Internet of Things, the automation of knowledge work, and cloud technology.

Two other possible developments rated highly on our assessment criteria and will be the focus of future MGI research in the region (see Box 2, "Two additional transformative opportunities: Skills development and resource productivity").

All three of these forces are creating new opportunities that call for long-term thinking and investment by both the public and private sectors. Capturing this potential could create immediate economic impact while placing ASEAN on a faster growth trajectory through 2030.

18 Based on cities with a population of 200,000 or more. This number reflects MGI's most recent estimate of the urban share of total GDP, which has been revised upward from 54 percent of GDP.

19 Defined as households with more than $7,500 in annual income (in 2005 purchasing power parity terms). The 81 million households figure reflects MGI's latest estimate of the size of the consuming class.

20 The World Economic Forum's Networked Readiness Index measures the ability of countries to exploit the opportunities offered by information and communications technology (ICT). The index is a composite of four components: the environment for ICT offered by a given country; the country's readiness in terms of affordability, skills and infrastructure; the usage of ICT among individuals, businesses, and governments; and the social and economic impact of ICT. For further details, see *The global information technology report 2014: Rewards and risks of big data*, World Economic Forum, April 2014.

## Box 2. Two additional transformative opportunities: Skills development and resource productivity

Although this report focuses on global flows, urbanization, and disruptive technologies, two other areas represent important building blocks for Southeast Asia's future growth. They will influence whether the region is able to create a more inclusive and sustainable model of development.

**Building the skills of tomorrow.** To fully harness the advantage of its enormous labor force, Southeast Asia must develop its human capital and workforce skills. In Indonesia and Myanmar alone, we project an undersupply of nine million skilled and 13 million semi-skilled workers by 2030.[1] Recent academic research suggests that based on current trends, more than half of all high-skill employment in Cambodia, Indonesia, Laos, the Philippines, Thailand, and Vietnam could be filled by workers with insufficient qualifications by 2025, resulting in underqualified workers.[2] In addition, skills gaps are a major driver of inequality and poverty in the region. Approximately 92 million ASEAN workers (roughly 30 percent of the region's workforce) live on less than $2 per day.[3] Three important measures are needed to address this issue: raising the quality of instruction by attracting and training great teachers, developing curricula geared to the needs of the economy, and creating new, flexible education pathways that take advantage of technology (such as Web-based interactive courses).[4] Although ASEAN's youthful population has produced a significant demographic dividend, the boost to economic growth is set to taper over the next decade. It will be imperative for member states to raise their labor force participation rates, particularly among women. If Indonesia could increase female participation in its workforce to match the level in Thailand today, for example, it would add 20 million semi-skilled to skilled workers. The ability to generate more inclusive economic growth depends on closing the region's education gaps and making the most of its untapped human capital.

**Creating a resource revolution.** The unprecedented pace and scale of economic development in emerging markets means demand for resources is surging even as new supplies of energy and metals are becoming more difficult and expensive to extract. These issues will play out all around the world, but particularly so across ASEAN, where demand for energy is forecast to increase though 2035 by around 80 percent, a rise that is equivalent to Japan's current total energy demand.[5] Southeast Asia is also acutely exposed to the risks of climate change and to the environmental pressures of groundwater depletion, air pollution, and unsustainable management of fisheries. This is a daunting list of challenges, but a new approach is possible, and it could generate tremendous economic value. In Indonesian agriculture, for example, a focus on boosting yields, shifting to higher-value crops, and reducing post-harvest waste could create an additional $150 billion of revenue by 2030.[6] Myanmar has similarly large opportunities, given that it has the 25th-largest endowment of arable land, ten times the per capita water endowment of China and India, and yet generally low levels of agricultural productivity. Energy demand could be reduced by more than 15 percent in some ASEAN countries through more efficient power generation, transportation, and buildings. Realizing these opportunities will require addressing a range of barriers, including financing, property rights (particularly in agriculture), and behavior change. But taking a greener and more sustainable approach to economic development would support productivity growth and result in greater food security, more livable cities, and better health outcomes.

1 For further details, see the McKinsey Global Institute's reports on Indonesia (*The archipelago economy: Unleashing Indonesia's potential*, September 2012) and Myanmar (*Myanmar's moment: Unique opportunities, major challenges*, June 2013).

2 *ASEAN Community 2015: Managing integration for better jobs and shared prosperity*, Asian Development Bank and the International Labour Organisation, August 2014.

3 Ibid.

4 The use of disruptive technologies to improve skills and education is partially addressed in Chapter 4.

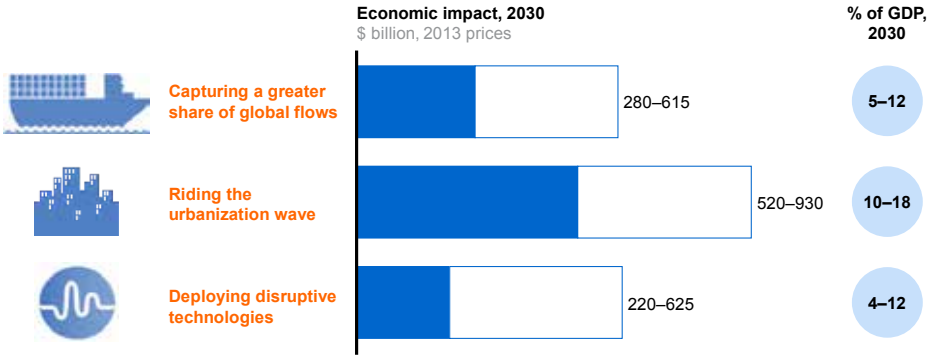
5 *World energy outlook special report: Southeast Asia energy outlook*, International Energy Agency and Economic Research Institute for ASEAN and East Asia, September 2013.

6 *The archipelago economy: Unleashing Indonesia's potential*, McKinsey Global Institute, September 2012.

Just how big could the prize be? While some of their effects could overlap, we calculated that each one of these forces could have economic impact of hundreds of billions of dollars by 2030 (Exhibit 6).

**Exhibit 6**

**Three economic opportunities have the potential for substantial impact across ASEAN by 2030**




NOTE: These figures are based on a partial-equilibrium analysis that estimates only first-order effects and therefore cannot be summed to calculate the full economic impact. Numbers are rounded to nearest $5 billion.
SOURCE: McKinsey Global Institute analysis

These projections are based on quantitative analysis as well as the insights of multiple industry and policy experts. While it is tempting to add these numbers together to provide a bullish forecast of economic growth in the region, we caution that these scenarios are not meant for simple addition. Each one was calculated in isolation and did not consider the second-order effects on prices and exchange rates.[21] Moreover, these opportunities are mutually reinforcing and thus contain some overlap. Capturing a greater share of global trade flows, for example, can create better manufacturing jobs in urban areas. If disruptive technologies are applied to education and worker training, they can make export industries more competitive by helping to address the skills shortages facing ASEAN member states.

It is also important to note that our calculations are not predictions of how much of the potential will actually be realized. They are meant to demonstrate how much value is at stake depending on whether business leaders and policy makers mobilize to pursue these opportunities.

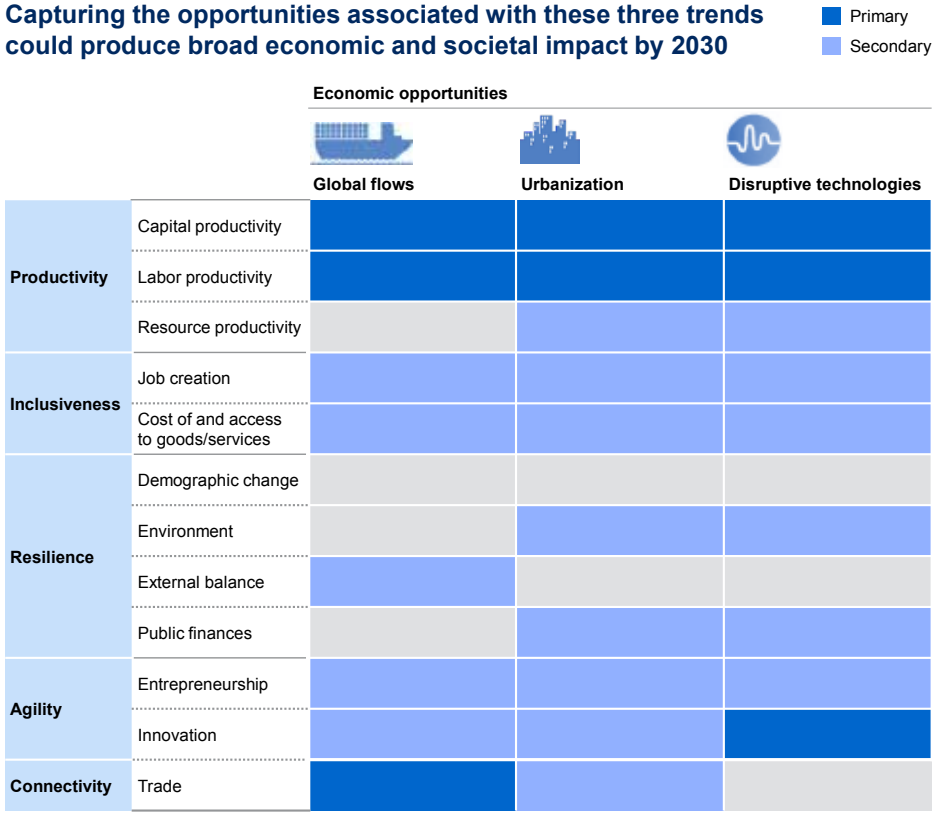
21 See the technical appendix for further details on the methodology used to size each economic opportunity.

## THESE ECONOMIC OPPORTUNITIES CAN TRANSFORM FIVE DIMENSIONS OF ASEAN'S ECONOMIES BY 2030

As mentioned earlier, the forces highlighted in this report were chosen for their ability to accelerate ASEAN's progress on five dimensions that past MGI work has found to be fundamental to creating sustainable and broad-based prosperity (Exhibit 7).[22]

Exhibit 7

**Capturing the opportunities associated with these three trends could produce broad economic and societal impact by 2030**




SOURCE: McKinsey Global Institute analysis

- **Productivity.** All three of these megatrends offer avenues for addressing the region's fundamental productivity challenges. Urbanization, for example, creates productivity benefits in three ways. First, it moves people from low-productivity jobs in rural agriculture to higher-productivity urban jobs. Second, it creates the critical mass and density necessary to produce economies of scale and network effects; the productivity of a city with 200,000 people is 3 to 8 percent higher on average than that of one with 100,000 residents.[23] Third, cities actually boost agricultural productivity by generating demand; they also make it possible for workers to send remittances to their families in the countryside, providing capital for tools and equipment that can make farming more efficient.

22 For further details, see *Reverse the curse: Maximizing the potential of resource-driven economies*, McKinsey Global Institute, December 2013.

23 Stuart S. Rosenthal and William C. Strange, "Evidence on the nature and sources of agglomeration economies," in *Handbook of urban and regional economics*, 1st ed., volume 4, J. V. Henderson and J. F. Thisse, eds., Elsevier, 2004.

Disruptive technologies can enable a leap forward in productivity beyond what is possible in brick-and-mortar operations. Mobile banking, for instance, is much more cost-effective than building out networks of bank branches and ATMs. Focusing on capturing more global trade flows can accelerate productivity and growth by bringing in international best practices from multinationals, eliminating inefficiencies by streamlining logistics, expanding access to skills, and encouraging specialization that highlights each country's comparative advantages.

- **Inclusiveness.** In the short term, the investment associated with these opportunities could generate significant numbers of jobs. For example, economists estimate that each $1 billion in infrastructure spending in the United States can create 10,000 to 28,000 jobs.[24] The job creation potential associated with building urban infrastructure in Southeast Asia is likely to be substantially greater given the region's higher labor-to-capital ratios—but even based on the US ratio, ASEAN could generate more than 5 million jobs by investing at the levels needed to maintain its infrastructure stock at 70 percent of GDP as the region's economy grows. Successful development of the AEC could spur further job creation. One study has suggested that it could result in a net increase of 14 million jobs in six ASEAN economies (Cambodia, Indonesia, Laos, the Philippines, Thailand, and Vietnam) by 2025.[25] Beyond the employment impact, these economic opportunities can create more inclusive growth in other ways. Disruptive technologies, in particular, can deliver vital public services to more remote areas. In the Philippines, for example, Text2Teach allows teachers to download short videos to mobile devices and screen them in the classroom. This type of technology could be transformative in countries such as Myanmar, where there is only around one teacher for every 30 schoolchildren and some rural areas may not have teachers at all.[26] Access to health care can be expanded through innovations such as telemedicine and remote patient monitoring. Indonesia has experimented with mobile ultrasounds, operated by trained midwives, to improve prenatal care in rural areas; the results are preliminary but promising for a country with a major shortage of doctors but well over 100,000 midwives. Technology can also streamline government services. In Singapore, for example, citizens can receive timely and personalized SMS alerts and notifications for passport renewals and road tax renewals; all government tenders are distributed through one website.[27]

24 See *Employment impacts of highway infrastructure investment*, US Federal Highway Administration, 2007. Other studies on the US economy have found broadly similar estimates. See, for example, James Heintz, Robert Pollin, and Heidi Garrett-Peltier, *How infrastructure investments support the US economy: Employment, productivity, and growth*, Political Economy Research Institute and Alliance for American Manufacturing, January 2009.

25 *ASEAN Community 2015: Managing integration for better jobs and shared prosperity*, Asian Development Bank and the International Labour Organisation, August 2014.

26 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

27 Ibid.

However, these forces could deepen inequality by accelerating structural change from lower- to higher-productivity sectors, reducing demand for less-skilled workers. In addition, some of the sectors that are likely to experience rapid growth, such as trade and transport as well as construction, are often associated with vulnerable and informal employment that lacks basic social or legal protection and employment benefits.[28] Disruptive technologies, especially the automation of knowledge work, could eliminate some clerical functions or routine customer service jobs; workers in these roles will need to adapt and learn the skills to carry out higher-value tasks. On the positive side, empowering technologies can give workers greater access to training and information, opening up new avenues for productive work. Minimizing the potential downside will require a focus on skills development, social protection, and support for smaller enterprises.

- **Resilience.** Effective responses to these trends will strengthen the region's ability to weather trade imbalances, demographic change, debt, or climate change. By enhancing global flows of trade, ASEAN countries can strengthen their external balances and help mitigate some of the risk from shocks like the Asian financial crisis. As highlighted earlier, the demographic boost that supported ASEAN's historical growth will start to weaken over the next decade. Finding ways to boost labor participation, particularly among women, will be important, and urbanization can help support this by placing more women in proximity to better-quality job opportunities. Taking a long-term approach to building urban infrastructure will also have to entail planning ahead for the effects of climate change, and disruptive technologies such as renewable energies and advanced energy storage can help support the shift away from fossil-fuel-based growth to curtail pollution and greenhouse gas emissions.

- **Agility.** These trends pose opportunities for the region to boost its capacity for innovation and its ability to adapt and find new sources of growth. Cities have long been hotbeds for innovation; almost a century ago, economist Alfred Marshall noted that spillovers in dense urban areas mean that "the mysteries of the trade become no mysteries; but are as it were in the air."[29] Throughout ASEAN's urban areas we can see such spillover benefits, with active clusters such as the Batam Free Trade Zone (Singapore-Indonesia), the Southern Regional Industrial Estate (Thailand), the Tanjung Emas Export Processing Zone (Indonesia), the Port Klang Free Zone (Malaysia), the Thilawa Special Economic Zone (Myanmar), and the Tan Thuan Export Processing Zone (Vietnam).[30] Disruptive technologies, almost by definition, will be important for strengthening agility and innovation in the digital age. Small but vibrant high-tech startup scenes are taking root in places such as Singapore, Kuala Lumpur, Ho Chi Minh City, and Manila as the entire region begins to build a greater capacity for innovation.

28 *ASEAN Community 2015: Managing integration for better jobs and shared prosperity*, Asian Development Bank and the International Labour Organisation, August 2014.

29 Alfred Marshall, *Principles of economics*. Macmillan, 1920.

30 *Ten of Asia's most dynamic export processing zones that you've never heard of*, Asia Briefing, April 24, 2014.

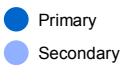
- **Connectivity.** Our exploration of global flows is all about the degree to which the region's economy can take advantage of opportunities within the region and abroad through cross-border transfer of goods, services, and skills. Completion of the AEC integration plan and the various trade deals currently under negotiation could significantly increase the connections among ASEAN economies and between ASEAN and global markets (see Box 1, "The AEC and a new vision for integration," earlier in this chapter).

## THESE ECONOMIC FORCES COULD DISRUPT ENTIRE INDUSTRIES

Expanded global trade, urbanization, and digital technologies will reverberate through multiple sectors (Exhibit 8). In some cases, they could prove to be disruptive. For example, the region's pace of urbanization calls for $7 trillion of investment in both core infrastructure and residential and commercial real estate; this represents major opportunities for the construction and real estate sectors. The addition of some 80 million new households to the consuming class, also driven by urbanization, creates enormous new markets for consumer-facing companies that can successfully navigate a fragmented wholesale and retail environment.

**Exhibit 8**

**The opportunities associated with these forces will benefit multiple sectors of the economy**




| Sectors | GDP, 2012[1] $ billion | Jobs, 2012[1] Million | Economic opportunities: Global flows | Urbanization | Disruptive technology |
|---|---|---|---|---|---|
| Resource extraction (e.g., oil and gas, mining) | 171 | 2 | Secondary | | Secondary |
| Agriculture | 258 | 94 | Secondary | Primary | Primary |
| Knowledge-intensive manufacturing (e.g., autos, aerospace, chemicals) | 176 | 33 | Primary | Secondary | Primary |
| Resource-intensive manufacturing (e.g., metals, pulp, refinery products) | 76 | | Secondary | Secondary | Primary |
| Labor-intensive manufacturing (e.g., apparel, furniture) | 117 | | Primary | Secondary | Primary |
| Construction and utilities | 190 | 17 | | Primary | Primary |
| Retail | 145 | 34 | Primary | Primary | Primary |
| Wholesale, transport, and logistics | 255 | | Primary | Primary | Primary |
| Information and media | 63 | | | | Primary |
| Financial, legal, and technical services | 212 | 8 | Primary | | Secondary |
| Real estate | 54 | | | Primary | Secondary |
| Hospitality and other services[2] | 113 | 41 | Secondary | Secondary | |
| Education and health care | 105 | 31 | Primary | Secondary | Primary |
| Government | 133 | | | Primary | Primary |

1 Includes only Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. GDP rounded to nearest billion; jobs rounded to nearest million.
2 Includes accommodation and food services, arts and entertainment, and personal services. These sectors will benefit indirectly from higher employment and spending.

SOURCE: IHS; Statistics Indonesia; Bank of Thailand; Department of Statistics Malaysia; Singapore Statistics; Philippines Statistics Authority; General Statistics Office Vietnam; McKinsey Global Institute analysis

Consumer-related sectors, as well as transportation and logistics, also stand to reap the benefits of global flows as the region pursues the goals of the AEC and dismantles the many non-tariff barriers that inhibit trade across the region today. These impediments are not limited to the flow of goods. The airline industry, for example, has ownership restrictions based on national origin, and domestic routes are open only to national carriers. With the prospect of increased tourism in the region, liberalizing the airline industry could set off a wave of growth in the sector and stimulate further competition between low-cost operators and the national incumbents.

In the automotive sector, deeper regional integration will offer manufacturers opportunities to achieve greater economies of scale, which could deliver cost savings worth 10 to 15 percent of the cost base. While some member states have large-scale, efficient automotive plants, others have automotive factories that produce fewer than 100,000 vehicles annually, which is below the industry's typical minimum operating threshold for efficiency.[31] But integration could set the stage for major productivity gains as it opens the door to consolidation across countries (although the political sensitivities mean that operators are more likely to add capacity in the most advantageous locations rather than actually moving operations).

Disruptive technologies will have a significant impact on the financial sector. Approximately 10 to 30 percent of the ASEAN banking sector's GDP in 2030 could be affected as technology expands financial inclusion for individuals, improves lending to SMEs, increases payment revenue, and reduces costs. McKinsey's experience in Asia suggests that individual banks could boost profits by up to 48 percent by utilizing technology to improve frontline productivity, reduce operating and credit costs, and target customer segments more accurately. But at the same time, technological change could threaten up to 36 percent of profits by eroding margins, unleashing new Internet-based competition, and introducing operational challenges related to data security.[32] In addition, ASEAN integration (which is progressing somewhat slowly in the financial services sector) could transform the competitive landscape. At a regional level, banking remains highly fragmented. Local controls over foreign bank entry and restrictions on foreign bank operations within domestic markets have prevented regional banking integration. This appears unlikely to change in many markets in the short term.[33] But if ASEAN-wide banking becomes a reality, institutions could achieve economies of scale by serving a larger customer base; they would also benefit from greater mobility of skilled labor across ASEAN countries. They would have the potential to emerge as globally competitive institutions with more sophisticated capabilities.

31 This is particularly true in Vietnam, the Philippines, and smaller countries that have smaller-sized plants. Note: 100,000 is the minimum operating threshold for efficiency in completely knocked-down production; the threshold rises to 200,000 for completely built unit production.

32 *Digital banking in Asia: Winning approaches in a new generation of financial services*, McKinsey & Company, January 2014.

33 Satria Sambijantoro, "Restriction on foreign banks eyed," *The Jakarta Post*, July 14, 2014.

Finally, disruptive digital technologies could transform the efficiency and transparency of government services. Moving to online channels can improve citizen access, lower costs, and streamline administrative functions. There are substantial productivity gains to be realized from better data availability and automation (such as pre-filling of forms across agencies). Advanced algorithms and big data analytics can also reduce fraud and error in transfer payments and tax collection.

□ □ □

Despite their distinct languages, ethnicities, and political systems, the ten member states of ASEAN share many common threads of history and culture—and now they could be on the brink of creating a common future as a more integrated region. If they can take advantage of the opportunities presented by increasing global flows of trade, urbanization, and breakthrough technologies, the region will be poised to make major strides in economic development and to expand the possibilities for what integration can achieve. In the chapters that follow, we explore the opportunities and implications posed by these forces in further detail.

# 2. Global flows: Capturing growth from trade connections

The web of economic interconnections between countries is becoming ever larger and more complex. In 2012, the flows of goods, services, and finance across borders reached $26 trillion, or 36 percent of global GDP. That is 1.5 times as large relative to GDP as they were in 1990—and current flows could nearly triple by 2025. MGI research has shown that countries that are more connected within global networks of flows experience larger benefits in terms of GDP growth than countries that are less connected.[34]

Southeast Asia is poised to capitalize on this global phenomenon. Already the fourth-largest exporting region in the world, ASEAN sits at the crossroads of many global flows. Several of its member states rank highly on the MGI Connectedness Index, which measures inflows and outflows of goods, services, finance, people, and data and communication. Increases in all five types of cross-border flows are already reshaping the region's economy.

The biggest potential for Southeast Asia in the near term, however, lies in capturing a larger share of the world's trade in goods. Two major developments are creating a unique window of opportunity. First, both intra-regional and global flows will deepen and accelerate if the ambitious ASEAN Economic Community (AEC) integration plan is successfully implemented, creating an open market of 600 million consumers and a more seamless production base. Second, as China's labor costs continue to rise, multinational companies will look for new production sites. This represents an opening for ASEAN member states to establish themselves as bigger hubs of manufacturing. The economic diversity of ASEAN member states could prove to be an advantage to this effort rather than an impediment. Within a single market, companies can optimize various operations, taking advantage of the region's unique combination of countries with low-cost labor, countries with intermediate manufacturing capabilities, and one of the most sophisticated financial and logistics centers in the world.

Together these opportunities could create some $280 billion to $615 billion in annual economic value by 2030, which would be equivalent to 5 to 12 percent of ASEAN GDP in that year.[35] Taking advantage of these trends will require policy makers to prioritize AEC integration and ensure that it is working on the ground. They will also have to make sure that the skills and the transportation and logistics infrastructure are in place to execute a well-defined strategy for attracting foreign direct investment (FDI).

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34 For further details, see *Global flows in a digital age*, McKinsey Global Institute, April 2014. Financial flows cover foreign direct investment, equity, bonds, and loans.

35 Based on varying academic estimates of the economic impact from ASEAN concluding bilateral free trade agreements with the United States, Europe, and other key Asia-Pacific countries in addition to AEC integration. See Michael G. Plummer and Siow Yue Chia, eds., *Realizing the ASEAN Economic Community: A comprehensive assessment*, Institute of Southeast Asian Studies, 2009, and Peter A. Petri, Michael G. Plummer, and Fan Zhai, "The ASEAN Economic Community: A general equilibrium analysis," *Asian Economic Journal*, volume 26, number 2, June 2012.

As a regional grouping, ASEAN does not have the deep institutional ties and infrastructure links that bind together the European Union. Nor has it built the kind of seamless supply chains that funnel massive trade flows through North America. But the region does have strong momentum and enormous potential—and if it can bring the AEC to fruition, ASEAN could emerge alongside China and India as an economic powerhouse.

## ASEAN IS WELL POSITIONED TO BENEFIT FROM GLOBAL FLOWS

ASEAN accounts for 7 percent of global exports, trailing only the European Union, North America, and China/Hong Kong among the world's leading export regions. Its international trade has almost tripled over the past decade.[36] As its member states have developed more sophisticated manufacturing capabilities, their exports have diversified. Vietnam specializes in textiles and apparel, while Singapore and Malaysia are leading exporters of electronics. Thailand has joined the ranks of major vehicle and automotive-parts exporters. Other ASEAN members have built export industries around natural resources. Indonesia is the world's leading producer and exporter of palm oil, the top exporter of coal, and the second-largest producer of cocoa and tin. While Myanmar is just beginning to open its economy, it has large reserves of oil, gas, and precious minerals. In addition to exporting manufactured and agricultural products, the Philippines has established a thriving business-process-outsourcing industry.

The MGI Connectedness Index sheds light on where each ASEAN country stands in terms of integration into the global economy.[37] It assesses 131 nations, tracking their inflows and outflows of goods, services, finance, people, and data and communication, relative to the size of their economies (Exhibit 9). Singapore is far and away the region's standout on the index, ranking fourth globally. Four other ASEAN countries also place in the top 50: Malaysia (18th), Thailand (36th), the Philippines (45th), and Vietnam (48th).

But there is a clear opportunity to build on these trends. Domestic demand, rather than exporting strength, has been the defining feature of Southeast Asia's growth story. In recent years, consumption, investment, and government spending have fueled the majority of economic growth in many ASEAN countries, while exports have played a surprisingly small role (Exhibit 10). While exports can be expected to make a smaller contribution to growth in larger economies such as Indonesia, this evidence suggests that there is room for further export growth in many ASEAN countries. Given its strategic location in relation to China, India, and Japan, the region is well positioned to derive greater benefits from all types of global flows. In fact, by 2025, more than half of the world's consuming class will live within a five-hour flight of Myanmar.[38]

36 Total ASEAN international trade amounted to $771 billion in 2003 and grew to $2.2 trillion by 2012, according to data from UN Comtrade.

37 The index measures the size of each country's inflows and outflows relative to its GDP or population (its "flow intensity"), as well as its share of global flows. Taking both measures into account corrects the tendency for small countries to rank high on trade intensity measures alone.

38 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013. The "consuming class" is defined as those with incomes exceeding $10 per day, the threshold at which disposable income becomes available for significant consumption of goods and services.

## Exhibit 9

### Five ASEAN countries rank among the world's 50 most connected nations

**MGI Connectedness Index and overall flows data, 2012**[1]

Rank of participation by flow as measured by flow intensity and share of world total

Connectivity index rank
- 1–10
- 11–25
- 26–50
- 51+

| Rank | Country | Goods | Services | Financial | People (2010) | Data and communication (2013) |
|---|---|---|---|---|---|---|
| 1 | Germany | 3 | 5 | 7 | 5 | 2 |
| 2 | Hong Kong, China | 1 | 4 | 3 | 14 | n/a |
| 3 | United States | 8 | 9 | 5 | 1 | 7 |
| 4 | Singapore | 2 | 3 | 4 | 18 | 5 |
| 5 | United Kingdom | 13 | 6 | 9 | 7 | 3 |
| 6 | Netherlands | 6 | 7 | 15 | 29 | 1 |
| 7 | France | 9 | 10 | 36 | 15 | 4 |
| 8 | Canada | 16 | 22 | 13 | 9 | 18 |
| =9 | Russia | 19 | 30 | 16 | 2 | 21 |
| =9 | Italy | 11 | 20 | 31 | 16 | 10 |
| | **ASEAN**[2] | | | | | |
| 4 | **Singapore** | 2 | 3 | 4 | 18 | 5 |
| 18 | **Malaysia** | 10 | 23 | 34 | 26 | 32 |
| 36 | **Thailand** | 12 | 19 | 27 | 94 | 56 |
| 45 | **Philippines** | 53 | 45 | 47 | 52 | 54 |
| 48 | **Vietnam** | 25 | 56 | 41 | 90 | 58 |
| 56 | **Indonesia** | 31 | 49 | 39 | 113 | 65 |
| 91 | **Cambodia** | 81 | 82 | 59 | 109 | 104 |

1 Index calculations use migrants data for people flows and cross-border Internet traffic for data and communication flows.
2 Brunei, Laos, and Myanmar are not included due to data limitations.
SOURCE: Comtrade; IHS; World Trade Organization; Telegeography; World Bank; McKinsey Global Institute analysis

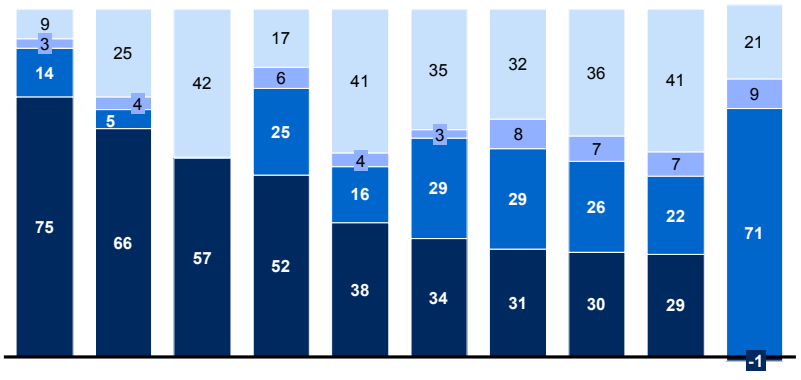
## Exhibit 10

### The contribution of exports to recent GDP growth varies widely among ASEAN countries

**Components of real GDP growth, 2009–13**[1]

%

Consumption
Government
Investment
Gross exports




| GDP compound annual growth rate, 2009–13 % | Singapore | Vietnam | Cambodia | Thailand | Myanmar | Indonesia | Malaysia | Laos | Philippines | Brunei |
|---|---|---|---|---|---|---|---|---|---|---|
| | 6.6 | 5.9 | 6.9 | 4.3 | 5.0 | 6.2 | 5.7 | 8.4 | 6.3 | 1.8 |

1 Calculated as growth contribution of components to total growth in consumption, government, investment, and gross exports. Excludes imports.
NOTE: Numbers may not sum due to rounding.
SOURCE: Economist Intelligence Unit; McKinsey Global Institute analysis

By assuming a greater role in global supply chains, the region can create a new economic engine that is more heavily driven by manufacturing and exports—and this could happen rapidly if ASEAN countries capitalize on two important developments that are looming on the horizon:

- **The ASEAN Economic Community is gradually becoming a reality.** Some 25 percent of the region's exports of goods go to other ASEAN countries, a share that has remained roughly constant since 2003. But intra-regional trade in goods (along with other types of cross-border flows) could increase with implementation of the AEC integration plan. This development could allow ASEAN to build integrated supply and value chains that span the entire region. Progress toward transforming this plan from an economic aspiration into a working reality has been uneven, but full integration could boost both intra-regional and global trade substantially.

- **Some of China's manufacturing is up for grabs.** As China shifts from an export-driven economic model to a consumption-driven model, its wages are rising. This could create an opening for Southeast Asian economies to become the next "factories to the world." Already Japanese FDI has been surging into ASEAN while growing at a much slower pace in China. In order to attract the operations of multinationals and turn them into the basis for a robust manufacturing economy, however, ASEAN cannot compete on low wages alone. In fact, its own wages have been rising recently, which is eroding this cost advantage.[39] The region will also have to compete on productivity, which can in turn lead to the creation of better jobs over time. Vietnam, Indonesia, and other member states are starting at a disadvantage on this front, with low productivity levels that have historically failed to keep pace with China's progress. The opportunity to capture more manufacturing could slip away unless the region makes major strides in efficiency. In addition, the ASEAN countries with higher labor costs (notably Malaysia and Thailand) will need to move up into more sophisticated and value-adding operations to offset these costs.[40]

## ASEAN'S ECONOMIC INTEGRATION: GLASS HALF FULL?

The freer movement of goods, services, skilled labor, and capital is at the heart of the AEC plan. In 2007, ASEAN member states committed to accelerating the integration process with the goal of forming a single market and production base by 2015.

The region has taken a number of positive steps, such as lowering trade tariffs (discussed below). But this has not yet produced a meaningful uptick in trade flows among ASEAN member states. Intra-regional trade reached its historic peak in 2007, when it accounted for 24.8 percent of total trade. In 2010, it remained roughly flat at 24.6 percent of total trade, and by 2012, it had slightly regressed to 24.1 percent.

But a closer look reveals significant variation between ASEAN's countries and sectors. Singapore and Malaysia have led the way, with 27 percent of their total trade conducted with regional partners. Vietnam lags further behind at only

39 *Should we worry about wage inflation in ASEAN?* Citi Research, December 2012.

40 *Asia's economic transformation: Where to, how, and how fast?* Asian Development Bank, August 2013.

17 percent. From a sector perspective, the strongest growth in intra-regional trade has occurred in automotive (with annual growth of 5 percent), electronics (5 percent), and basic materials (2 percent). But there has been no or negative intra-regional trade growth in traditionally protected and labor-intensive sectors such as rubber, wood, fisheries, and agriculture; this has created a drag on overall integration efforts.[41]

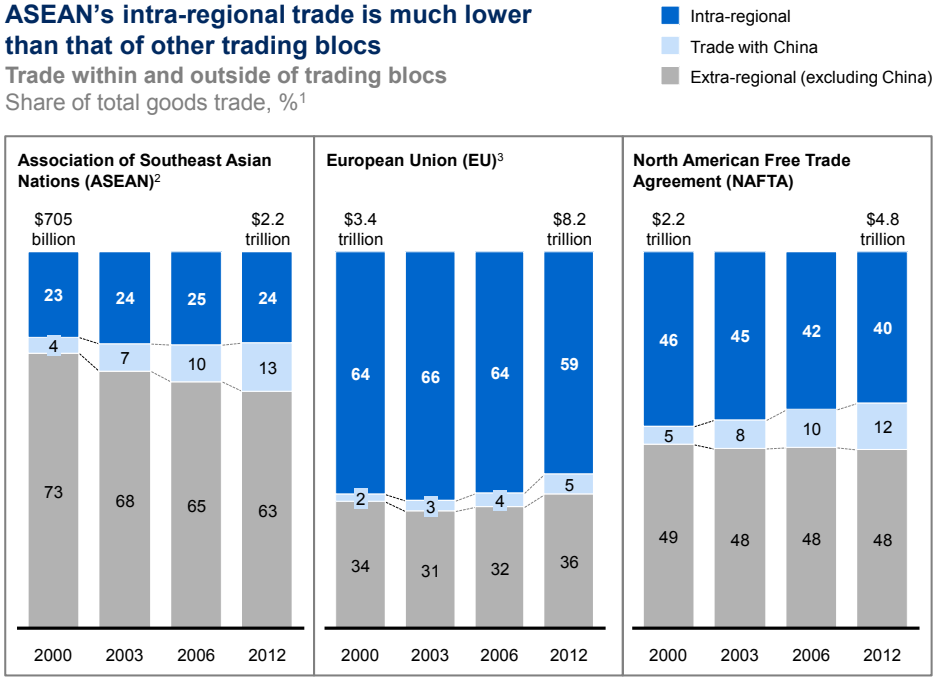
ASEAN's goal of becoming a truly unified market is still a work in progress. Intra-regional trade accounts for less than half the share of total trade in ASEAN as in the European Union (Exhibit 11). An examination of other trade blocs can provide insights for ASEAN as it seeks to deepen its ties (see Box 3, "Lessons from other trade groupings").

**Exhibit 11**

**ASEAN's intra-regional trade is much lower than that of other trading blocs**

**Trade within and outside of trading blocs**

Share of total goods trade, %[1]




1 The value of total trade calculated as imports into ASEAN from extra-ASEAN plus all exports out of ASEAN (to avoid double counting).
2 ASEAN 10.
3 EU-27.
NOTE: Numbers may not sum due to rounding.
SOURCE: Comtrade; McKinsey Global Institute analysis

ASEAN member states will sometimes have to compete against each other for market opportunities and multinational operations. But examining the industrial structure of ASEAN countries suggests that in many cases, their areas of specialization could be complementary rather than competitive, which could further deepen trade flows and set the stage for pan-regional value chains to take root. In recent years, there has been a decline in export similarities (or an increase in economic complementarity). The exceptions to this trend are Indonesia and Malaysia, perhaps due to the commodity boom, which heightened demand for some of their common exports, such as palm oil.[42]

41 Comtrade data and McKinsey Global Institute analysis

42 *ASEAN long view: New pistons for a growth engine*, Citi Research, June 2014.

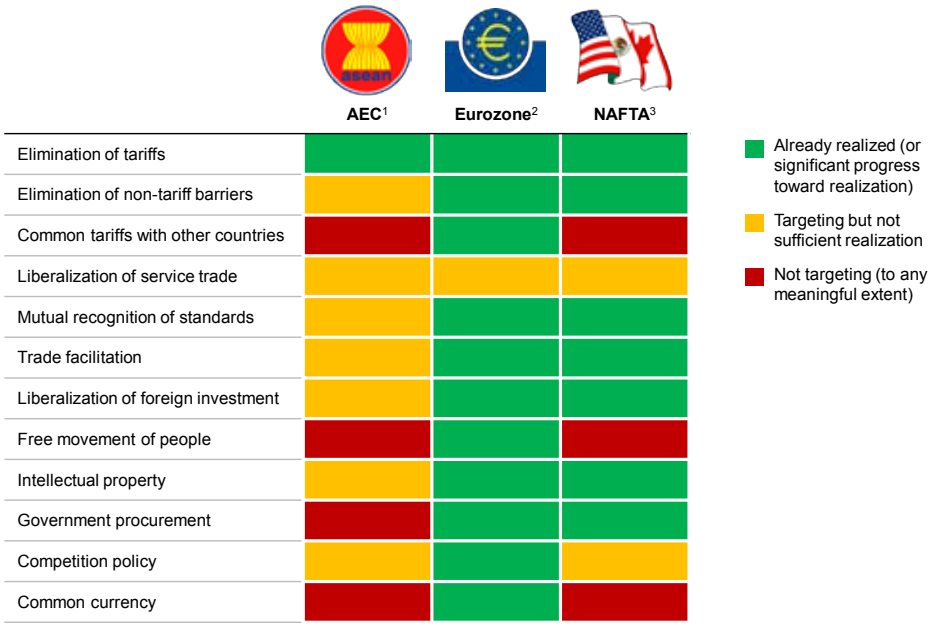
## Box 3. Lessons from other trade groupings

In the past half century, more than 585 regional trade agreements have been created. Most were launched with great fanfare and high expectations, but just over half are still in existence today.[1] Given the high rate of failure, it is crucial to understand the factors that underlie the success or failure of trade groupings. The European Union (EU) Single Market and the North American Free Trade Agreement (NAFTA), in particular, have gone beyond reciprocal trade and tariff arrangements to forge a new model of deep regional integration.

It should be noted that neither of these blocs is fully comparable to ASEAN, which is at a much earlier stage of economic development. ASEAN also does not aspire to the political integration and single currency of the Eurozone. It is starting out with more limited resources, competing political priorities, and fragmentation. ASEAN also differs in many ways from NAFTA, which has somewhat similar aspirations but is much further advanced in implementation (Exhibit 12).

Exhibit 12

**The ASEAN Economic Community (AEC) differs from other regional economic cooperation agreements**




1 The AEC comprises the 10 ASEAN countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.
2 Refers to the monetary union created in 2002. Includes Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain. A further 10 member countries are in the European Union but do not have the common currency.
3 North American Free Trade Agreement. Comprises Canada, Mexico, and the United States.

SOURCE: Japan External Trade Organization; International Trade Administration, US Department of Commerce; McKinsey Global Institute analysis

1 *Regional trade agreements: Facts and figures*, World Trade Organization. By 2014, the WTO has been notified of approximately 585 regional trade agreements. Of those, only 380 are still in force. Approximately 58 percent of the regional trade agreements were free trade agreements, 32 percent were economic integration agreements, 7 percent were customs unions, and 4 percent were partial scope agreements.

## Box 3. Lessons from other trade groupings (continued)

Nevertheless, there are important lessons to be gleaned from these regions:

**A strong fact base is needed to counter concerns with integration.** Some ASEAN countries, particularly the less developed member states, worry that the benefits of deeper integration will pass them by. However, based on analysis of past models of integration, such fears appear unfounded. In fact, less developed countries have often benefited disproportionately from integration. NAFTA has arguably conveyed its greatest benefits on Mexico, which has enjoyed a manufacturing boom (especially in the automotive sector) since the treaty went into effect. Its exports rose from 1.1 million vehicles in 1994, when NAFTA was signed, to nearly 2.9 million in 2012.[2]

Others feel that ASEAN member states vary too widely in their stages of economic development for integration to work well. While divergences in economic performance between EU member states have been a key challenge, the form of integration envisaged under the AEC is more heavily focused on trade flows and does not include a common currency or monetary policy. In this form of integration, those very differences between member states create advantageous conditions for value chains to form by enabling companies to draw on the respective competitive advantages of each country in their operations (for example, low-cost labor sourced from Myanmar, high-tech manufacturing from Singapore). It is crucial for the ASEAN Secretariat and member governments to build a strong fact base on the economic case for integration.

**Successful integration can't just be top-down.** Integration efforts in both the EU and NAFTA have been plagued by a lack of popular support at certain points. As regional observers have noted, ASEAN has fundamentally been a top-down project, driven by the region's leaders and not its people. This approach worked well in the early years, but as member states have become progressively more democratic, it has become more important to solidify public support. ASEAN's leaders will need to communicate the benefits of integration more widely and build momentum for change from the ground up.

**A strong institutional framework is needed to drive action.** Past evidence on successful integration shows that a strong institution is needed to drive action, but the ASEAN Secretariat currently lacks the resources for the scale of the task.[3] In 2012, the secretariat had a staff of only 300 people compared with the 34,000-strong staff of the European Union. The Asian Development Bank estimates that the ASEAN Secretariat will need more than 1,600 employees if it is to fulfill its mandate.[4] Unlike other intergovernmental associations, ASEAN is unique in that it receives equal contributions from all member states to its operational budget. Given the wide variations in wealth of ASEAN member countries, this results in a structurally low ceiling for funding of the Secretariat. In addition, ASEAN has no sanctioning mechanism for delays in reaching agreed targets, and the consensus-based decision-making system slows operational decisions. Finally, the interface between the Secretariat and ASEAN member governments needs to be strengthened.

2 *A tale of two Mexicos: Growth and prosperity in a two-speed economy,* McKinsey Global Institute, March 2014.

3 Hans Vriens, "How will the new Southeast Asian community resolve its differences?" *Nikkei Asian Review*, June 12, 2014.

4 *ASEAN 2030: Toward a borderless economic community*, Asian Development Bank, July 2014.

## ASSESSING PROGRESS ON AEC INTEGRATION

Determining the current level of progress on integration toward a single ASEAN market and production base (pillar one of the AEC Blueprint) is not a straightforward task. For each of the five flows (namely goods, services, investment, capital, and skilled labor), there is a detailed list of actions, initiatives, and targets to be achieved by specific dates. The ASEAN Secretariat prepares an AEC scorecard, and in the latest update from October 2013, it declared that 79.7 percent of scheduled targets had been achieved. Efforts have continued since then, including signing of the Memorandum of Understanding for the ASEAN Collective Investment Schemes framework in 2013 pursuant to pillar one of the blueprint.[43]

While the scorecard provides broad indicators, it has certain limitations for evaluating implementation of the AEC, as it lacks specificity and leaves latitude for interpretation. The objective for non-tariff barriers, for example, is to "abide by the commitment of a standstill and roll-back on non-tariff barriers." Furthermore, the scorecard does not offer a view of how implementation is unfolding by sector. In some cases, it simply notes whether governments have agreed to adopt a certain policy, but not whether that policy has been enacted in legislation or applied. The data used to calculate the level of progress are also based on a self-assessment provided by member states. The ASEAN Secretariat is exploring an outcome-based monitoring system to complement its current approach.[44]

We have produced an assessment by sector that seeks to highlight where the barriers to integration are actually falling. This analysis aims to reflect the state of "on-the-ground" integration in terms of the free flow of goods, services, investment, and skilled labor as actually experienced by businesses rather than progress on the adoption of policies as outlined in the AEC Blueprint. This lens reveals a slightly different story. Tariffs have been removed on many types of goods, but other types of barriers remain a stumbling block to freer trade, and progress on liberalizing services and investment has been slower (Exhibit 13). There is no sector today that is fully integrated across the dimensions that matter for cross-border operations. In the automotive sector, for example, non-tariff measures such as import licensing and other quantity control measures constrain manufacturers' ability to grow.

43 *Chairman's statement of the 23rd ASEAN Summit*, in Bandar Seri Begawan, Brunei, October 9, 2013.

44 See the ASEAN Regional Integration Support from the EU (ARISE) website at arise.ASEAN.org/workshop-on-formulation-of-an-enhanced-scorecard-mechanism/.

## Exhibit 13

### Levels of integration vary significantly by sector

Progress on ASEAN economic integration by sector[1]

Progress (%) 0–24 25–49 50–74 75–99 100

| | | Tariffs | | Non-tariff measures | | Trade procedures | | | | | Services | Invest-ment | Labor | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Tariffed goods | Tariffed amount | Standards and regu-lations | Other non-tariff measures[2] | Single window status | Single window trade | Customs | Trade speed | Trade cost | Services restric-tiveness | FDI restric-tions | Labor mobility | Average | Lowest |
| Goods | Agriculture, fisheries | 91 | 88 | 57 | 70 | 70 | 58 | 61 | 85 | 94 | | 71 | | 75 | 57 |
| | Rubber | 93 | 98 | 98 | 96 | | | | | | | 71 | | 82 | 58 |
| | Wood | 94 | 99 | 96 | 75 | | | | | | | 68 | | 80 | 58 |
| | Textiles | 96 | 99 | 99 | 73 | | | | | | | 81 | | 82 | 58 |
| | Auto | 94 | 94 | 94 | 39 | | | | | | | 81 | | 77 | 39 |
| | Electronics | 98 | 99 | 57 | 62 | | | | | | | 81 | | 76 | 57 |
| | Consumer | 94 | 99 | 60 | 56 | | | | | | | 81 | | 76 | 56 |
| | Resources[3] | 84 | 93 | 79 | 89 | | | | | | | 61 | | 78 | 58 |
| Services | Air travel | | | | | | | | | | 71 | 61 | n/a[5] | 66 | 61 |
| | E-ASEAN[4] | | | | | | | | | | 60 | 47 | | 54 | 47 |
| | Health care | | | | | | | | | | 33 | 83 | 10 | 42 | 10 |
| | Tourism | | | | | | | | | | 71 | 90 | 30 | 64 | 30 |
| | Logistics | | | | | | | | | | 46 | 94 | n/a[5] | 70 | 46 |
| | Finance | | | | | | | | | | 59 | 64 | | 62 | 59 |
| | Telecom | | | | | | | | | | 60 | 47 | | 54 | 47 |
| Average | | 93 | 96 | 80 | 70 | 70 | 58 | 61 | 85 | 94 | 57 | 72 | 20 | 69 | 20 |

1 Based on assessments of Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Brunei, Cambodia, Laos, and Myanmar excluded due to lack of comprehensive data; Singapore excluded to avoid bias toward developed economies.
2 Includes administrative charges, certificates of approval, import licensing, quantity control measures, internal taxes, and prohibition measures.
3 Includes mining, and oil and gas.
4 Digital readiness through connectivity, local content, e-commerce, common marketplace for ICT goods and services, skills development, and e-governance.
5 Sectors not covered in mutual recognition agreements.
SOURCE: McKinsey Global Institute integration database

It is important to note the caveats in our own assessment. It is based on a simple weighting of subcomponents to determine the overall level of integration by sector, but certain factors are more important in practice. Indeed, our survey of firms (discussed below) reveals that businesses are more concerned about some specific barriers to integration than others. Additionally, access to data is limited, so we have relied on publicly available sources and treated those nations with available data as representative of the region.[45]

45 For the purposes of this report, unless otherwise stated, progress has been assessed in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. There was a lack of detailed data for Brunei, Cambodia, Laos, and Myanmar; Singapore was removed from the analysis to avoid skewing the results. The assessment is also based on integration as envisaged under the AEC Blueprint. A score of 100 percent does not necessarily indicate complete integration but rather achievement of the AEC aspirations in that area. For example, the labor mobility dimension measures progress against the AEC goals for specific occupations, not for the completely free movement of labor in the sector. See the technical appendix for further details on the methodology.

While full integration appears highly unlikely by the 2015 milestone set by ASEAN leaders, there has been real momentum. The most notable step forward has been the drastic elimination of tariffs. Average tariff rates in the original five member states (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) have been virtually zero since 2010.

But other types of barriers are falling more slowly. A 2013 survey found that 38 percent of multinational companies operating in Southeast Asia believed customs procedures were not at all uniform across the region. More than half felt there had been little progress on smoothing out cross-border regulations governing traded services. The five sectors highlighted by respondents as having the lowest degree of harmonization across ASEAN's borders were media and marketing, property and construction, commodities and energy, consumer goods, and health care and pharmaceuticals.[46]

However, there has been some movement to align standards: ASEAN countries agreed to eliminate restrictions on the trade of electrical and electronic equipment by harmonizing technical requirements, for example.[47] Integration is proceeding faster for traded goods (particularly automotive, textiles, and wood) than for services (such as finance and health care). In certain subsectors, such as cosmetics and lighting, progress has been particularly strong.

Two factors seem to be important for creating momentum. First is the mindset of business leaders. In some sectors, integration is clearly perceived as a "win-win," and local stakeholders are not resisting change. The second is whether key companies in a given sector are willing to devote resources to working with officials to drive the process forward. In the cosmetics industry, for example, four years of groundwork by the ASEAN Consultative Committee on Standards and Quality resulted in the signing of the ASEAN Harmonized Cosmetic Regulatory Scheme, which reduces technical barriers to trade. L'Oréal championed this effort in conjunction with regional regulators and the broader cosmetics industry so that products produced or marketed in any signatory country that meets regulatory requirements can enter other signatory countries. The scheme also shifts oversight of cosmetics from a pre-market approval process to a post-market surveillance approach. Governments play a fundamental role in setting the conditions that either enhance or constrain the flow of goods and services, and their engagement is crucial to removing these types of legislative and regulatory barriers.

46 *Riding the ASEAN elephant: How business is responding to an unusual animal*, Economist Corporate Network, March 2013.

47 *Agreement on the ASEAN harmonized electrical and electronic equipment (EEE) regulatory regime*, ASEAN Secretariat, December 9, 2005. Efforts to reduce non-tariff barriers include the Mutual Recognition Arrangement for Electrical and Electronic Equipment, the Agreement on the ASEAN Harmonized Electrical & Electronic Equipment Regulatory Regime, and ASEAN Conformity Mark. However, some barriers still remain. For example, in Malaysia electrical and electronic equipment must pass safety standards and in the Philippines, electrical and electronic equipment must be inspected by the standards agency. See *Standard for electrical and electronic equipment in ASEAN market*, prepared by Reverse Brain Drain Section of the National Science and Technology Development Agency (Thailand), September 2013. For more on efforts in other sectors, see Simon Pettman, *Standards harmonisation in ASEAN: Progress, challenges and moving beyond 2015*, Economic Research Institute for ASEAN and East Asia, November 2013.

Despite the lower tariffs they represent, the region's free trade agreements are underutilized. An Economist Intelligence Unit survey shows that the average usage rate of each of the free trade agreements signed by Indonesia, Malaysia, Singapore, and Vietnam is only 26 percent. In other words, each is used, on average, by roughly only one in four exporters.[48] Malaysia's usage of free trade agreements is lowest, at 16 percent, followed by Singapore at 21 percent, Vietnam at 37 percent, and Indonesia at 42 percent. While it is somewhat more utilized than the average free trade agreement, the average usage rate for the ASEAN free trade area is still only 50 percent. Vietnam makes the highest use of it, at 65 percent, followed by Indonesia (51 percent), Singapore (43 percent), and Malaysia (39 percent).

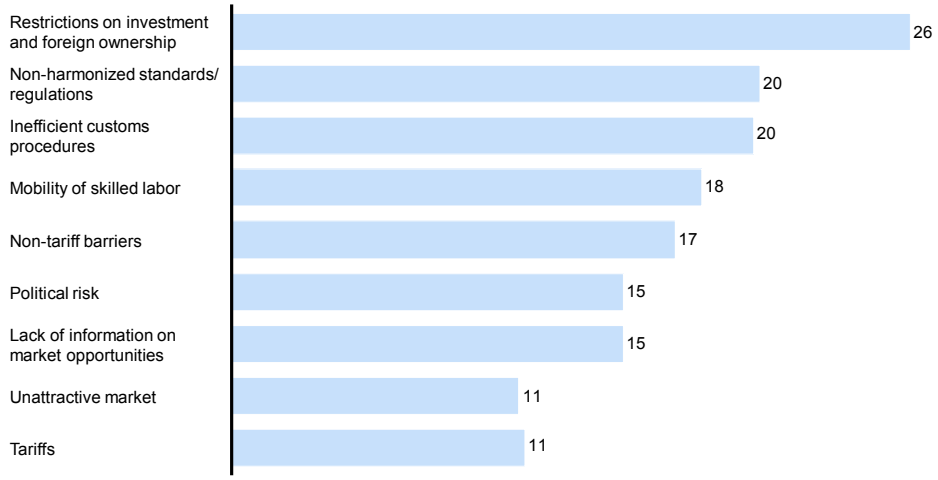
To understand why businesses are not making greater use of these frameworks to increase trade, we surveyed more than 90 firms across ASEAN (including small and medium-sized enterprises, local corporations, and multinationals) and conducted numerous interviews. Their responses highlighted some specific barriers, such as restrictions on foreign direct investment, non-harmonized standards and regulations, and inefficient customs procedures (Exhibit 14).

**Exhibit 14**

**The region's businesses consider liberalizing foreign direct investment, harmonizing standards, and improving customs efficiency to be priorities**

**Barriers to trading in ASEAN**

% of survey respondents who identified each issue as "a major barrier"[1]




1 Sample size of 96 respondents.
SOURCE: McKinsey Global Institute analysis

The constraints on foreign investment vary significantly by country and sector in ASEAN (Exhibit 15). Sectors of strong national interest, such as aviation and telecommunications, noticeably lag behind the other, more liberalized sectors such as logistics.

48 *FTAs in South-east Asia: Towards the next generation*, Economist Intelligence Unit, 2014. The survey covered executives from 400 companies in Singapore, Malaysia, Indonesia, and Vietnam (100 from each country). The survey was weighted toward SMEs: 80 percent of the respondent companies had annual revenue between $50 million and $150 million, while 20 percent had revenue in excess of $150 million.

**Exhibit 15**

**Foreign ownership restrictions remain in some sectors, including aviation, telecoms, and financial services**

Foreign equity ownership index[1]

0–24 25–49 50–74 75–99 100

| | | Vietnam | Malaysia | Indonesia | Philippines | Thailand | ASEAN[2] |
|---|---|---|---|---|---|---|---|
| Goods | Agriculture | 100 | 70 | 95 | 40 | 49 | 79 |
| | Wood | 100 | 100 | 49 | 40 | 49 | 77 |
| | Manufacturing | 75 | 100 | 69 | 75 | 87 | 87 |
| | Mining, oil and gas | 50 | 70 | 98 | 40 | 49 | 72 |
| Services | Aviation | 66 | 100 | 49 | 40 | 49 | 62 |
| | Telecom | 50 | 40 | 57 | 40 | 49 | 62 |
| | Health care | 100 | 100 | 65 | 100 | 49 | 88 |
| | Tourism | 100 | 100 | 100 | 100 | 49 | 93 |
| | Logistics[3] | 100 | 70 | 100 | 100 | 100 | 96 |
| | Financial services[4] | 65 | 49 | 99 | 60[6] | 49 | 75 |
| Cross-sector[5] | | 81 | 80 | 78 | 64 | 58 | 79 |

1 Measures related to overt statutory restrictions on foreign ownership of equity in new investment projects (greenfield FDI) and on the acquisition of shares in existing companies (mergers and acquisitions). 100 = full foreign ownership allowed.
2 Malaysia, Indonesia, the Philippines, Thailand, Vietnam, Cambodia, and Singapore (excludes Brunei, Laos, and Myanmar due to data availability).
3 Retail distribution services used as proxy for logistics.
4 Banking used as proxy for financial services.
5 Includes only focus sectors profiled above, not exhaustive of sectors in the economy.
6 Philippines signed into law "full entry of foreign banks" in July 2014.

SOURCE: *Investing across borders*, World Bank Group, 2012; McKinsey Global Institute analysis

## DEEPER ECONOMIC INTEGRATION HAS HUGE UPSIDE POTENTIAL FOR ASEAN

While some commentators have suggested that ASEAN member states vary too widely in economic development to create a well-functioning single entity, this misses the point. Large divergences in economic performance between countries are a critical challenge where there is a common currency and unified monetary policy, as in the European Union. But the looser form of integration envisaged in the AEC is more focused on trade flows, which makes diversity a strength. Dismantling tariff and non-tariff barriers reduces costs, facilitating intra-regional trade. It also paves the way for the proliferation of cross-border production networks that can fully exploit the diverse range of comparative advantages across ASEAN member states.[49]

Companies can draw upon the different competitive advantages of the various ASEAN economies in their operations—for example, conducting labor-intensive activities in Myanmar and Vietnam, doing more complex assembly in Thailand and Malaysia, and conducting high-end research and development (R&D) activities in Singapore. In addition, some sectors will be complementary to others. Increased activities in financial intermediation, real estate, renting, and business activities are complementary to manufacturing; they also enable greater specialization and division of labor. By outsourcing accounting and human resource management to a specialized subcontractor, manufacturers can focus on their core competencies.[50] By creating new markets and improving productivity, further integration can boost the creation of better-quality jobs as well as generating the economic benefits described below.

49 *ASEAN long view: New pistons for a growth engine*, Citi Research, June 2014.

50 *Asia's economic transformation: Where to, how, and how fast?* Asian Development Bank, August 2013.

### Creating new demand and competition

Integration will accelerate the flow of trade and encourage companies to enter new markets, making a more diverse range of products and services available. It could, for example, enable retailers to stock a much broader range of merchandise, sparking consumer demand for new products. One representative of a multinational consumer goods company predicted that being able to expand into different ASEAN markets could increase the company's revenue by more than 5 percent. Removing many of the inefficiencies associated with exporting will lower the prices of many goods and services—putting them within the reach of millions of new consumers for the first time. This will have the effect of boosting overall consumption across the entire ASEAN region, leading to a virtuous cycle of growth.

In addition, a sizable and direct benefit of integration is reducing the revenue lost due to product stock-outs. Running out of inventory when customers need the goods causes companies to resort to emergency shipments, supplier substitution, and substitution to less profitable items, all of which have cost and revenue impact. Improved logistics networks (in terms of costs and efficiency) will speed time to market and allow large companies to be more nimble in the way they respond to new opportunities with product development and distribution.

ASEAN integration could also spur increased competition, which past MGI and other academic research have demonstrated is crucial for driving productivity and growth.[51] Academic research generally focuses on three mechanisms by which competition affects productivity. First, competition encourages managers to reduce inefficiencies.[52] For example, research by McKinsey and the London School of Economics has shown a strong correlation between the level of perceived competition and management quality, which in turn is closely linked to firms' productivity growth. Second, through changes in market share, and entry and exit rates, competition reallocates resources toward the most productive firms (improving the efficiency with which resources are allocated).[53]

51 See for example, *Investing in growth: Europe's next challenge*, McKinsey Global Institute, December 2012.

52 Margaret A. Meyer and John Vickers, "Performance comparisons and dynamic incentives," *Journal of Political Economy*, volume 105, number 3, June 1997; Klaus M. Schmidt, "Managerial incentives and product market competition," *Review of Economic Studies*, volume 64, number 2, April 1997. Two streams of literature have analyzed the effects of competition on incentives. In the first, Meyer and Vickers analyze competition effects in terms of the comparative performance information that other firms can provide, enabling the principal to estimate agent effort with greater precision. In the second, Schmidt analyzes the direct effects of product market competition on agent effort.

53 Jens Arnold, Giuseppe Nicoletti, and Stefano Scarpetta, *Regulation, allocative efficiency and productivity in OECD countries: Industry and firm-level evidence*, OECD Economics Department working paper number 616, 2008, for example, finds that at the industry level, resources were allocated less efficiently across firms in countries where service regulations are less market-friendly.

Finally, competition exposes firms to new ideas and provides an incentive for them to innovate.[54] There is, for example, empirical evidence showing that more competition has the greatest positive effect on productivity in sectors in a country that lags far behind in its use of technology because this competition introduces concepts from others that are well tested, which can increase productivity quickly.[55] At present, given the range of foreign investment restrictions and trade barriers, competitive pressures have not been unleashed in many sectors. These dynamics will create new winners and losers, but the overall benefits to ASEAN economies could be significant.

### Cost savings

In industries where production costs decrease as output increases, being able to exploit economies of scale is an important competitive advantage. Companies are better able to do that when technical regulations are harmonized and mutual recognition agreements allow companies to produce more standardized products and pool skilled labor.

The automotive, electronics, and food manufacturing industries have already begun to consolidate production. However, McKinsey's work across a range of manufacturing sectors has found opportunities to create scale benefits worth between 5 and 15 percent of the total cost base. In automotive, for example, smaller factories in locations such as Vietnam and the Philippines operate below the industry's typical minimum efficiency threshold, but integration could set the stage for major productivity gains.[56] Even in financial services, economies of scale can be achieved by consolidating data processing centers and other support functions.

Companies will benefit if the delays and administrative costs associated with clearing customs are reduced. The costs of importing and exporting are 24 percent higher in ASEAN than in China at present, and the region's customs procedures are 66 percent slower than the Organisation for Economic Co-operation and Development (OECD) average.[57] Increasing trade volumes can also lower average unit costs by creating economies of scale in transportation.

A harmonized market can lower inventory costs by reducing the number of specialized products companies need to keep in stock and minimizing obsolescence (goods arriving after customers need them). Reducing "factory-to-shelf" time and enabling lower inventory levels can also help preserve working

54 Stephen J. Nickell, "Competition and corporate performance," *Journal of Political Economy*, volume 104, number 4, August 1996; Philippe Aghion et al., "Competition and innovation: An inverted-U relationship," *Quarterly Journal of Economics*, volume 120, number 2, May 2005. Academics dispute the exact relationship between competition and innovation. While academics such as Nickell find clear evidence of a positive relationship between competition and innovative activity at the industry level, others such as Aghion et al. find that the impact of competition on innovation depends on specific industry characteristics (e.g., the distance of a given firm to the technology frontier).

55 Giuseppe Nicoletti and Stefano Scarpetta, "Regulation, productivity and growth: OECD evidence," *Economic Policy*, volume 18, number 36, 2003.

56 100,000 is the minimum operating threshold for efficiency in completely knocked-down production; the threshold rises to 200,000 for completely built unit production.

57 Logistics costs are measured as import and export procedure costs, including document preparation, customs clearance, and technical control, ports and terminal handling, and inland transportation and handling as per the World Bank's Doing Business database. The cost to import and export is based on standardized cargo (a full 20-foot container).

capital—and these savings are particularly important for SMEs, which often find financing to be a key constraint. In food manufacturing, for example, these savings could be worth around 5 percent of the total cost base.

Savings would also accrue from eliminating duplicate testing and certification procedures as well as other transaction costs associated with a fragmented market. We interviewed one representative of a consumer company that created a separate design, packaging, and labeling team to deal with certification in one ASEAN country alone because the regulations were so burdensome.

Given the progress on tariff reductions that has already taken place, much of the incremental benefits that could be realized in the years ahead are not related to tariffs but would stem from addressing the other issues highlighted above. This is consistent with academic research: a 2013 study found that further tariff reductions in ASEAN would likely have little impact on GDP in most countries except for Cambodia, Laos, and Vietnam (where tariffs remain high). But liberalization of services and a reduction in the time and costs involved in importing and exporting would yield more substantial gains.[58]

The ability to have freer movement of labor is critical in industries that require specific technical skills that may be in short supply locally. Executives in the financial services sector mentioned this as a constraint on expanding into the less developed parts of ASEAN. It is hard to find local workers with the necessary education and skills, but the administrative burden of moving their own skilled employees into these markets is often prohibitive.

So what is the actual value of full integration? Our analysis found that in many sectors, greater integration could produce productivity benefits worth up to 20 percent of the cost base in addition to boosting demand and creating consumer surplus (Exhibit 16).[59]

In electronics manufacturing, for example, most impact is likely to come in the form of scale benefits and inventory cost savings, with the total impact accounting for between 11 and 21 percent of the cost base. In automotive, as discussed earlier, there are also substantial potential scale benefits from integration, but fewer productivity savings elsewhere. In food manufacturing, given the perishable nature of the products, more savings are associated with reducing stock-outs and obsolescence.

These findings are consistent with academic evidence and business survey results. A 2009 study found that a complete elimination of tariff and non-tariff barriers, liberalization of five service sectors, AEC-induced changes in FDI, and a 5 percent reduction in trade costs could increase the region's GDP by 5.3 percent vs. the baseline.[60] A more recent estimate suggested that by 2025, the AEC could raise the region's GDP growth by 7.1 percent above the baseline forecast.[61]

58 Ken Itakura, *Impact of liberalization and improved connectivity and facilitation in ASEAN for the ASEAN Economic Community*, Economic Research Institute for ASEAN and East Asia discussion paper number 2013–01, January 2013.

59 We have not sized the benefits related to demand, but the impact on both demand and consumer surplus could be significant.

60 Michael G. Plummer and Siow Yue Chia, eds., *Realizing the ASEAN Economic Community: A comprehensive assessment*, Institute of Southeast Asian Studies, 2009.

61 *ASEAN Economic Community 2015: Managing integration for better jobs and shared prosperity*, Asian Development Bank and the International Labour Organisation, August 2014.

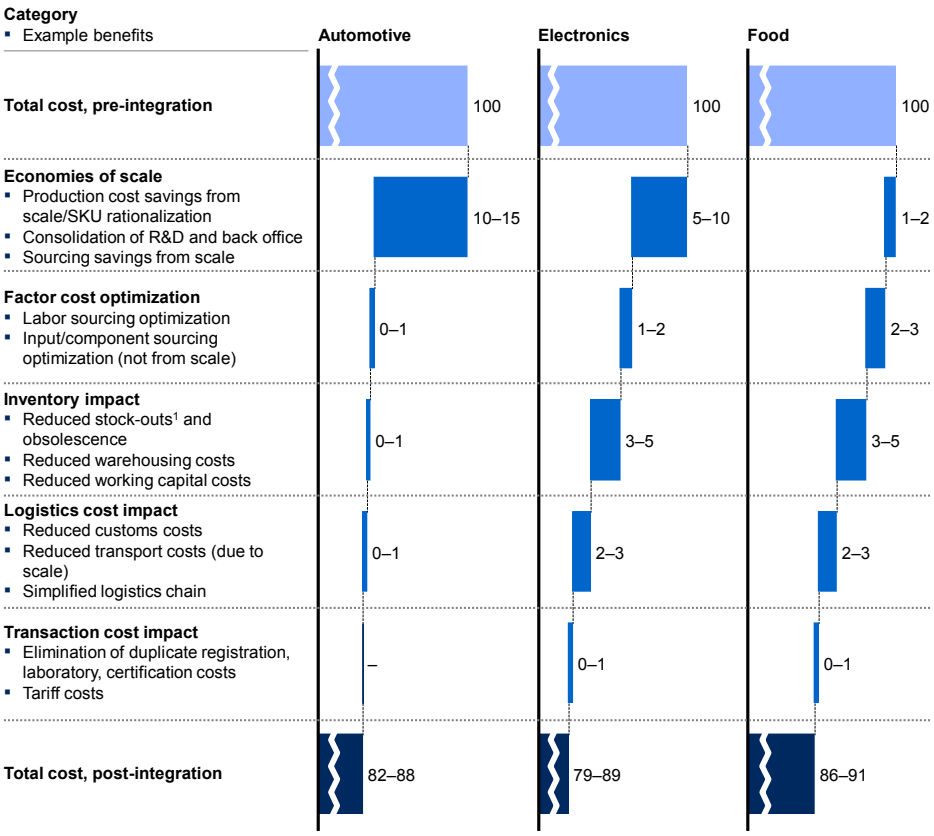
## Exhibit 16

### Accelerating ASEAN integration could unleash substantial economic value

EXAMPLE SECTORS

**Direct cost impact in consumer goods**

% of total cost




1 Stock-outs drive emergency shipments and substitution (revenue loss included here as a direct benefit of integration).
NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

A recent survey by the American Chamber of Commerce in Singapore found that 77 percent of respondents across ASEAN believe integration will be important for helping their companies do business in the region.[62] Our own survey of firms echoed these results, finding that most firms are quite optimistic about the potential benefits from integration. No respondent identified a negative impact, and more than 50 percent suggested a positive impact of greater than 10 percent (Exhibit 17).[63] Our estimates of the economic impact in various sectors are similar in scale to what firms reported.

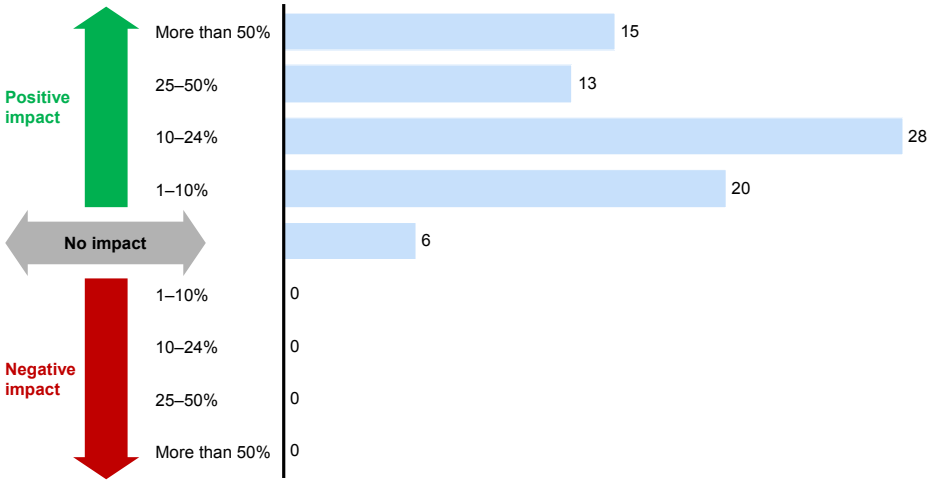
62 *ASEAN business outlook survey 2014*, American Chamber of Commerce Singapore and the US Chamber of Commerce, August 2014.

63 Based on a McKinsey survey with 96 respondents across all ASEAN countries. Respondents included operations across all ASEAN countries and included small startups (19 percent), SMEs (19 percent), and large companies with more than 200 employees (63 percent). Some of the industry sectors represented were consumer and retail, financial services, education, energy, utilities and mining, agriculture, food manufacturing, health care, rubber, textiles, automotive, aviation, logistics, telecommunications, and manufacturing.

Exhibit 17

**More than half of survey respondents believe that integration could boost their profits by more than 10 percent**

"How much of your sector's profits (EBITDA) could potentially be impacted by ASEAN economic integration?"
% of responses[1]




1 Sample size of 96 respondents (19% of respondents answered "don't know").
SOURCE: McKinsey Global Institute analysis

## THE IMPLICATIONS OF ECONOMIC INTEGRATION VARY BY SECTOR

While the overall economic benefits of integration for the broader region and many sectors are clear, the gains will not necessarily be distributed evenly. In some cases, regional manufacturing and production value chains will form, possibly with higher-income countries such as Indonesia, Malaysia, and Thailand producing more intricate components and low-wage countries such as Cambodia, Laos, Myanmar, and Vietnam acting as assembly hubs. This would mirror the pattern that emerged in the automotive sector in the European Union: automakers created manufacturing capacity in Eastern Europe to take advantage of lower labor costs, while keeping some of more strategic and R&D-intensive activities in the region's more developed countries. There is already evidence of plants in Eastern Europe gaining volume and preparing to take on more complex manufacturing processes to offset their rising wage costs.

In other cases, there may be a win-lose scenario in which better-performing firms flourish and lesser-performing firms could perish. Greater openness will bring new international competition and battles for market share, and firms have to be prepared to respond quickly. Evidence from the European Union suggests that those sectors with large economies of scale (such the airline and automotive industries) could experience the greatest disruptions in the competitive landscape.[64]

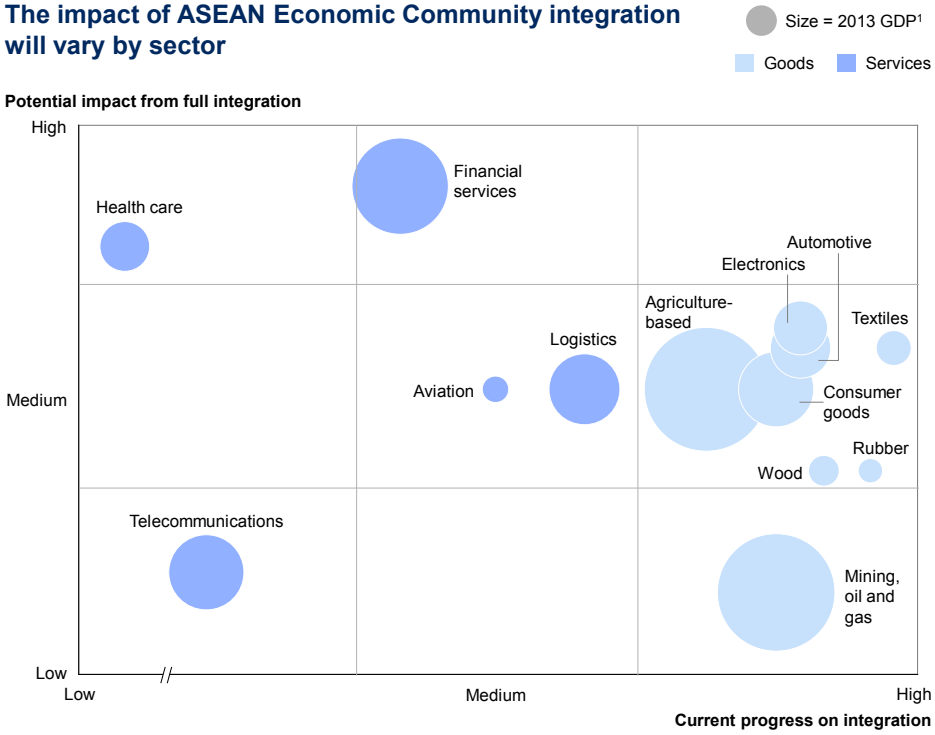
The thrust of an individual company's strategy depends on the current progress of integration and the potential impact by sector, a continuum that is mapped out in Exhibit 18. The current progress on integration is based on a detailed

64 Lionel Fontagné, Michael Freudenberg, and Nicolas Péridy, *Intra-industry trade and the single market: Quality matters*, Centre for Economic Policy Research discussion paper number 1959, September 1998.

assessment of tariffs, non-tariff measures, trade procedures, service sector restrictiveness, FDI restrictiveness, and labor mobility (as discussed earlier in this chapter). The potential impact from integration is based on expert and company interviews, together with MGI analysis. It includes productivity savings from economies of scale, transaction costs, logistics costs, inventory costs, and factor cost optimization as well as increased demand stemming from access to new markets and reduced stock-outs, for example. It does not include the potential impact of trade deals between ASEAN members and other countries, nor the second-order effects on the sector from integration (such as the boost to overall economic growth and the resulting impact of that growth on the sector's revenues).

**Exhibit 18**

**The impact of ASEAN Economic Community integration will vary by sector**




1 2013 sector GDP for Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Tourism and e-ASEAN not included due to lack of available data. Agriculture-based sectors include fisheries.

SOURCE: Expert interviews; IHS; McKinsey Global Institute analysis

In some sectors, such as automotive and electronics, there is both high potential impact and strong progress; in these cases, firms will need to move decisively to capture the potential benefits and respond to heightened competition that arises in a more unified regional market. In sectors such as financial services and health care, the potential impact from integration is high, but current progress is limited. The highest priority in these sectors is working with policy makers to make the case for integration and providing expertise and resources to work through the various issues. In sectors such as telecommunications, current progress is slow and the potential impact is more limited, but even these companies will need to monitor developments and prepare accordingly.

The section that follows recaps some of the most pressing sector-specific issues raised by ASEAN integration.

### Financial services

ASEAN countries are highly concentrated markets for financial services, with the top three players accounting for 40 to 50 percent of total assets (except in Vietnam). At a regional level, however, banking remains fragmented due to differing and sometimes incompatible regulations from country to country. The lower-income member states are still developing financial infrastructure, regulatory frameworks, and capabilities. In particular, Cambodia, Thailand, and Indonesia have low shares of foreign banks, the majority of which are based outside the region.[65] This segmented landscape results in small asset pools and limited liquidity, making it difficult for regional institutions to compete in international financial markets. It also makes these institutions vulnerable to shocks from outside the region.

Local controls over foreign bank entry and restrictions on foreign bank operations within domestic markets have prevented regional banking integration. Apart from licensing and ownership rules, there are restrictions on the movement of skilled employees and information as well as on how operations can be centralized. For example, Indonesia limits temporary stays of specialists for branch offices of foreign banks and joint venture banks to three months per specialist per year.[66] It also restricts foreign accountants to a ratio of one foreigner to three Indonesians.[67]

The AEC Blueprint addresses financial services separately from other service sectors, and it suggests that financial liberalization may not proceed at the same pace and speed in every country, since governments need to prioritize financial stability. The ASEAN Central Bank governors endorsed the ASEAN Banking Integration Framework in April 2011; however, progress has been slow given the sensitivity of the issues.[68] In addition to setting up criteria for qualified ASEAN banks, the academic work underpinning the framework outlined five regulatory areas requiring harmonization: bank accounting standards and disclosure requirements, minimum capital requirements, prompt corrective action, and methodologies for the resolution of failed banks, restrictions on large exposure, and anti-money-laundering and consumer protection regulations.[69]

Similarly, on the capital markets side, the ASEAN Collective Investment Scheme framework enables fund managers to offer their investment products directly

65 Park et al., "Combined study on assessing the financial landscape and formulating milestones for monetary and financial integration in ASEAN," mimeo, Bank Indonesia, 2011, as quoted in Maria Monica Wihardja, *Financial integration challenges in ASEAN beyond 2015*, Economic Research Institute for ASEAN and East Asia discussion paper number 2013–27, November 2013.

66 ASEAN Agreement on the Movement of Natural Persons database, ASEAN Secretariat.

67 Services Trade Restrictions database, Development Economics Research Group, World Bank.

68 The framework aims to provide financial stability in the region, as well as achieving multilateral liberalization in the banking sector by 2020 for ASEAN commercial banks. Four preconditions have been agreed upon and working groups set up for each: harmonization of principles of prudential regulations; building financial stability infrastructure; providing capacity building for Brunei, Cambodia, Laos, Myanmar, and Vietnam; and setting up agreed criteria for ASEAN qualified banks to operate in any ASEAN country with a single "passport."

69 Park et al., "Combined study on assessing the financial landscape and formulating milestones for monetary and financial integration in ASEAN," mimeo, Bank Indonesia, 2011, as quoted in Maria Monica Wihardja, *Financial integration challenges in ASEAN beyond 2015*, Economic Research Institute for ASEAN and East Asia discussion paper number 2013–27, November 2013.

to retail investors via a streamlined process. But only Malaysia, Singapore, and Thailand have opted in, even though the framework was endorsed by the ASEAN finance ministers in 2009.[70] On the trading side, progress has also been slow. The ASEAN Trading Link, launched in September 2012, integrates equity markets across Malaysia, Singapore, and Thailand to create a single platform for trading ASEAN equities. But two of the region's biggest financial markets, Indonesia and the Philippines, have so far postponed their entry.[71]

In fact, integration has actually been stronger between ASEAN member states and countries outside of the region. For example, Singapore has been granting licenses under its qualifying full bank category for more than a decade now; of the eight current licenses, only one is held by an ASEAN-based bank (Malayan Banking Berhad).[72] Among the license holders are the State Bank of India (2008) and ICICI Bank (2010), by virtue of a bilateral agreement between India and Singapore.[73] Notably, there has been little progress on setting criteria for ASEAN-qualified banks to operate in any ASEAN country.[74] As a result of this limited progress, the AEC is unlikely to spark dramatic changes in the financial sector in the near term. But as ASEAN businesses become more competitive and develop a stronger presence regionally and globally, financial services providers will piggyback on their growth.

Despite the limited progress to date, further ASEAN integration in the finance sector could have several important implications. First, an integrated banking market reduces costs by enhancing competition and allowing institutions to achieve economies of scale (through serving a larger customer base, pooling skilled labor, and consolidating back-office functions such as data centers). Second, greater integration could promote the emergence of more globally competitive institutions with more sophisticated capabilities. Third, transaction costs could fall. There could be significant efficiencies in cross-border payments by avoiding using US dollars as an intermediate step when converting from one ASEAN currency to another, for example, which would lower the cost to businesses and individuals of sending cash transfers across countries. As all of this unfolds, the banking sector may increase its penetration into new segments and grow more specialized. There could also be a wave of acquisition activity.

70 Nazir Razak, "Can the AEC deliver on its promises?" *The Edge Malaysia*, July 14, 2014.

71 See "The ASEAN trading link explained," *Asia Etrader Magazine*, issue 3, 2012.

72 Singapore's qualifying full bank category permits establishment of service locations and sharing of ATM networks.

73 "MAS announces changes to the qualifying full bank programme," Monetary Authority of Singapore press release, June 28, 2012.

74 Maria Monica Wihardja, *Financial integration challenges in ASEAN beyond 2015*, Economic Research Institute for ASEAN and East Asia discussion paper number 2013–27. Establishing the agreed criteria for ASEAN qualified banks is one of four prerequisites agreed upon by the ASEAN Central Bank governors when they endorsed the ASEAN Banking Integration Framework.

### Airlines

Southeast Asia's airline industry is one of the priority service sectors targeted for integration by the AEC. It has enjoyed robust growth over the past ten years, fueled by the entrance of a number of low-cost airlines such as Lion Air, AirAsia, and Tiger Airways and by the gradual but ongoing removal of visa requirements for short-term travel by ASEAN citizens in member states.[75] On the customer side, competition has lowered fares, creating new demand and making intra-regional travel within Southeast Asia one of the fastest-growing global markets over the past five years. According to Amadeus, a travel technology company, budget airlines or low-cost carriers from India, Indonesia, Malaysia, and Thailand accounted for more than half of global low-cost carrier seat capacity growth in the first half of 2013.[76] Open-sky policies, which have progressively opened routes between capital cities and subregions, have encouraged competition from new entrant carriers on routes previously dominated by national carriers.

But integration remains a work in progress. There have been some improvements in ease of travel between ASEAN countries for ASEAN citizens, but several barriers remain. Myanmar, for example, has not yet concluded visa-free travel agreements with Indonesia, Malaysia, Singapore, or Thailand. The more ambitious target of an ASEAN single visa will likely take some time to accomplish.

There are also barriers on the supply side. Domestic routes are open only to national carriers. The ASEAN Multilateral Agreement on Air Services and the ASEAN Multilateral Agreement on the Full Liberalization of Passenger Air Services would allow air carriers to serve any international route within ASEAN, but they do not apply to domestic routes and have yet to be ratified by all member countries.[77] This is still short of the progress made by Europe toward an "open skies" model. Current regulations have forced operators to set up separate, partially owned subsidiaries in different ASEAN countries in order to gain access to the local market. These restrictions prevent Southeast Asian carriers from achieving the type of pan-regional economies of scale that have made European low-cost carriers successful. There are also restrictions on bilateral traffic rights between major cities and a lack of common standards across the region for systems such as air traffic control and engineering.

In addition, ASEAN carriers today are struggling today with overcapacity and high cost bases. Some have posted heavy losses in recent years. Consolidation, either within the region or with other international airlines, may be the longer-term endgame. However, in ASEAN, as elsewhere around the world, airlines are a highly protected industry that is closely linked to national identity and national development concerns, especially boosting tourism. Full mergers are also complicated by international air route rights. Without further global liberalization, true consolidation is hard to achieve. Special structures, as used in the Air France and KLM consolidation and by the LATAM Group of airlines in Latin America, could be needed.

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75 *The impact of visa facilitation in ASEAN member states*, World Travel and Tourism Council, January 2014.

76 *Low-cost airline capacity booms in Asia and takes a huge leap in Eastern Europe*, Amadeus, October 2013. See also *Shaping the future of travel: Macro trends driving industry growth over the next decade*, Oxford Economics commissioned by Amadeus, 2014.

77 *ASEAN 2030: Toward a borderless economic community*, Asian Development Bank, July 2014.

### Utilities

Energy demand in ASEAN is forecast to increase by around 80 percent by 2035—a rise that is equivalent to Japan's current total energy demand.[78] The ASEAN Plan of Action for Energy Cooperation 2010–2015 attempts to address this growing issue.[79] It outlines collaborative partnerships to develop the ASEAN Power Grid and the Trans-ASEAN Gas Pipeline, both of which will involve building cross-border infrastructure connections. To realize these initiatives, much work remains to be done, such as harmonizing technical and regulatory standards, phasing out end-user price subsidies, ensuring third-party grid and pipeline access, and establishing a regional regulator.[80] However, these ambitious plans are expected to meet only a portion of ASEAN's projected demand.

Delivering a reliable energy supply to any location in ASEAN will require a concerted effort on a number of other fronts: creating an open access system, establishing a more cooperative structure for trading and for maintaining and operating interconnected systems, and harmonizing gas specifications and gas transit regulations. This will help promote electricity and gas trading beyond bilateral connection.[81]

### Automotive

The automotive sector has already benefited from integration, particularly from tariff reductions in the ASEAN-5 countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand). But it still faces non-tariff barriers such as import licenses (including quantity control measures and sensitive product licenses), luxury taxes, technical regulations (including quality standards and emissions regulations), and prohibitions.[82]

Further integration will offer automakers opportunities to achieve greater economies of scale, which could deliver cost savings worth 10 to 15 percent of the cost base. As highlighted earlier, automotive factories in some ASEAN countries today produce fewer than 100,000 vehicles annually, which is below the industry's typical minimum operating threshold for efficiency.[83] The industry could potentially address that by consolidating production across countries, although the political sensitivities mean that carmakers are more likely to add capacity in the most advantaged locations than to actually move operations. Thailand is potentially well positioned to benefit from the growth in a more unified market. McKinsey analysis of the automotive sector has shown that although Thailand's

78 *World energy outlook special report: Southeast Asia energy outlook*, International Energy Agency and Economic Research Institute for ASEAN and East Asia, September 2013.

79 The plan sets out the overall strategic directions of energy cooperation in ASEAN, defining the regional policy objectives, strategies, and action plans across seven programs: ASEAN Power Grid, Trans-ASEAN Gas Pipeline, Coal and Clean Coal Technology, Renewable Energy, Energy Efficiency and Conservation, Regional Energy Policy and Planning, and Civilian Nuclear Energy.

80 *World energy outlook special report: Southeast Asia energy outlook*, International Energy Agency and Economic Research Institute for ASEAN and East Asia, September 2013.

81 Beni Suryadi, "ASEAN Economic Community 2015: Integration of energy infrastructure," *The Energy Collective*, September 17, 2011.

82 Non-Tariff Measures database, ASEAN Secretariat.

83 Indonesia, Malaysia, and Thailand have larger-scale auto plants; Vietnam, the Philippines, and other countries have smaller plants. Note: 100,000 is the minimum operating threshold for efficiency in completely knocked-down production; the threshold rises to 200,000 for completely built unit production.

costs are 20 to 25 percent higher than those of Indonesia and Vietnam, it benefits from a strong existing automotive ecosystem (see Box 5, "The Thai automotive hub," later in this chapter).[84]

Across the ASEAN region, experts predict that industry growth will accelerate due to increased regional demand from Myanmar and other new markets. Over the longer term, this growth will create room for new hubs of production to form in other ASEAN countries that act soon to build capabilities and capacity.

### Telecommunications

Telecommunications is not one of the priority sectors identified in the AEC plan, but it could nonetheless be affected in several ways. First, AEC officials are discussing plans to bring down roaming prices within ASEAN through region-wide regulatory action. The potential impact on sector profits is uncertain and will depend on the extent to which traffic increases relative to the price decline.[85] In China, for example, reductions in roaming rates were followed by a 46 percent increase in roaming traffic.[86] Progress on this issue in ASEAN to date has been limited due to the complexities of aligning multiple national regulators. In the interim, a joint ASEAN and EU workshop on voice and data roaming held in September 2012 concluded that bilateral agreements between ASEAN member states to reduce mobile roaming charges would be a preferable short-term solution. This type of action had already been taken by Singapore and Malaysia in 2011.[87]

Second, there are real economies of scale to be realized in the telecom sector. For example, Telefónica operates across 24 countries, with a strong presence in Europe and Latin America. It expects to achieve almost $2 billion of gross savings in the long term from a new and more consolidated operating model, of which 10 to 15 percent is from IT shared services (and other IT management initiatives) and 55 to 65 percent is from a more integrated network.[88] In ASEAN, a number of barriers on foreign ownership and operations prevent companies from realizing these types of efficiencies across borders. For example, Indonesia's foreign ownership restrictions mandate 100 percent domestic ownership in the construction, management, and ownership of cellular phone towers; foreign equity stakes are limited to 65 percent for mobile operators and 49 percent for fixed-line networks. In the Philippines, both mobile and fixed-line telephone are considered public utilities, with foreign equity limited to 40 percent by the constitution.[89] Liberalizing these restrictions to inject more international competition could strengthen the information and communications technology (ICT) sector across the region—which is in turn critical for providing digital building

84 For further details, see *Understanding ASEAN: The manufacturing opportunity*, McKinsey & Company, October 2014.

85 *Bilateral mobile roaming price control in ASEAN: The Singapore-Malaysia case*, Axiata, November 2011.

86 *Working party on communication infrastructures and services policy: International mobile roaming agreements*, OECD, June 2013.

87 Data roaming, Multimedia Messaging Service, and video calls are not covered in the bilateral arrangement between the Infocomm Development Authority of Singapore and the Malaysian Communications and Multimedia Commission.

88 Telefónica annual report 2013. Reported expected saving of €1.5 billion is converted at exchange rate current at time of writing to $1.97 billion.

89 *Preserving stability and promoting growth: World Bank East Asia-Pacific economic update*, World Bank, April 2014.

blocks for growth in other sectors including financial services, business services, health, education, utilities, and logistics. Finally, greater scale could encourage more product innovation, given the size of a unified ASEAN market.

### Consumer goods

There has been significant progress on reducing tariffs on consumer goods. But inconsistent standards across different regional markets as well as other non-tariff barriers continue to pose challenges to both production and sales. Companies have to navigate import licenses that are selectively awarded, certificates of approval, quotas, excise and luxury taxes, and restricted import channels.

Technical regulations relating to everything from quality standards to registration with the Ministry of Health, labeling, testing, inspection, and quarantine can vary from country to country across the region.[90] Food companies, for example, must meet one set of requirements for their products to be certified as halal in Malaysia, but a different set of standards in Indonesia (and neither country's requirements are in line with Saudi Arabia's standards). The documentation associated with some of these certification requirements is also burdensome (see Box 4, "The barriers to beef").

The consumer goods sector will realize much of the economic value associated with a more integrated market in the form of logistics and inventory costs savings as these kinds of procedures are streamlined. In many cases where scale is beneficial, it has already largely occurred. Companies that specialize in perishable products or those with highly localized preferences (such as those in the food and beverage category) are unlikely to consolidate to the same degree as, for example, the automotive industry, given the variety of products and the need to source many inputs locally. There is also clear opportunity for companies that are already "national champions" to expand regionally due in part to easier, faster, and cheaper logistics and the ability to leverage local assets, knowledge, and economies of scale. The market for many products in the region is dominated by multinationals and national champions, with few "regional champions" (Exhibit 19).[91]

90 Non-Tariff Measures database, ASEAN Secretariat.

91 In this analysis, we define "regional champions" as those based in ASEAN and having more than $50 million total retail value and a multi-ASEAN country footprint (defined as 10 percent or more of total retail value generated in a country other than the primary country of operations). A "multinational" meets the size and footprint requirements but is based outside ASEAN. A "national champion" is defined as an ASEAN-based company with more than $50 million total retail value and a single-ASEAN country footprint (or no more than 10 percent of total retail value generated in a country other than the primary country of operations).

## Box 4. The barriers to beef

ASEAN has been dismantling tariffs over the past decade, but the same cannot always be said for other types of trade barriers—and because they persist, protectionism is still the reality in many industries. It is difficult to quantify the impact of these regulatory, procedural, and practical hurdles, but they are front and center among the concerns of the region's businesses.

To give just one illustration, consider the steps a manufacturer in another country has to take in order to export meat products to Indonesia. The company has to comply with food laws (such as import duties, quality requirements, and bans on certain imported agricultural products in certain ports), labeling requirements, and packaging and container regulations; regulations on food additives; regulations on pesticides and other contaminants; copyright and/or trademark laws; and halal regulations and certification. But that's not all. Processed food products are subject to import procedures spanning multiple government departments.[1] As of December 2013, the steps included:

1. **Import approval.** Importers must obtain import approval from the National Agency of Drug and Food Control for processed animal products.

2. **Letter of recommendation.** Importers must then obtain a "Recommendation on Technical Veterinary Public Health" (RTK) from the Directorate of Livestock and Animal Health Services of the Ministry of Agriculture for live animal and animal products. The application must include the product being imported and its ultimate destination (restaurant, hotel, catering, or industry).

3. **Establishment approval.** Only approved meat and poultry establishments are allowed to export products to Indonesia, and so the importer must work with the exporter to apply for establishment status from the Ministry of Agriculture, with reference to Ministry of Trade regulations.

4. **Import permit.** The RTK must then be submitted to the Ministry of Trade to obtain an import permit. Import volumes are determined through this process, but permits can be applied for only quarterly.

5. **Certificate of health.** A certificate of heath must be obtained from the exporting country, and that certificate must also indicate the import permit number.

6. **Entry permit.** All imported processed food, food raw materials, food additives, processing aids, food ingredients, and the like must obtain an entry permit issued by BPOM (Indonesia's food and drug regulator) to release the products at customs. The importer must provide the specified data and documentation, and at least two-thirds of the products' shelf life must be remaining at time of export.

7. **Import registration number.** Products in retail packaging must have an import registration number. Imported package products sold to retailers can be registered with the BPOM only by local agents.[2]

8. **Quarantine.** Physical and document examination, as well as laboratory testing of products, must be carried out by Indonesian quarantine officials when entering the port.

This degree of regulation is reflected in the size of the trade flow in this category. Indonesia has the third-lowest per capita rate of meat importation among the ASEAN nations, above only Myanmar and Cambodia. Approximately $1 of meat per person enters Indonesia annually, compared with $150 of meat per person entering Singapore and $27 worth entering Malaysia.[3]

The barriers to entry in terms of administrative burden, delay, and product compliance are often prohibitively high—and not just for meat products. Streamlining these types of procedures and harmonizing standards and regulations across ASEAN would boost the region's productivity.

1 *Indonesia: Food and agricultural import regulations and standards*, USDA Foreign Agricultural Service, Global Agricultural Information Network report number 1363, December 2013.

2 *GAIN Report ID1043*, USDA Foreign Agricultural Service, January 27, 2011.

3 UN Comtrade, Importation of HS code 2: Meat and edible meat offal (Vietnam and Laos excluded from analysis due to unavailable data); 2013 population data from IHS.

Exhibit 19

## ASEAN's landscape is dominated by multinationals and national champions, with few regional champions

Analysis by retail value and geography, 2013

EXAMPLE COMPANIES

Number of companies

| | Multinational | Regional champion | National champion | |
|---|---|---|---|---|
| | Global company with ASEAN footprint | ASEAN company with significant multi-country footprint[1] | Strong presence in a single ASEAN country | Total[2] |
| Packaged food and beverages[3] | 40 | 15 | 96 | 441 |
| | ▪ Nestlé<br>▪ Artisanal<br>▪ Royal FrieslandCampina<br>▪ Unilever Group<br>▪ Groupe Danone | ▪ JG Summit Holdings<br>▪ San Miguel<br>▪ Charoen Pokphand Group | ▪ Indofood Sukses Makmur (Indonesia)<br>▪ Vietnam Dairy Products (Vietnam)<br>▪ Monde Nissin (Philippines)<br>▪ Masan Group (Vietnam)<br>▪ Mayora Indah (Indonesia) | |
| Beauty and personal care | 25 | 1 | 15 | 177 |
| | ▪ Unilever Group<br>▪ Procter & Gamble<br>▪ L'Oréal Groupe<br>▪ Colgate-Palmolive<br>▪ Johnson & Johnson | ▪ Mandom | ▪ Better Way (Thailand)<br>▪ Giffarine Group of Cos (Thailand)<br>▪ SSUP Group (Thailand)<br>▪ Splash (Philippines)<br>▪ Kino Sentra Industrindo (Indonesia) | |
| Apparel and footwear | 27 | 1 | 13 | 142 |
| | ▪ Adidas Group<br>▪ Inditex, Industria de Diseño Textil<br>▪ Nike<br>▪ Bata Ltd.<br>▪ Wacoal Holdings | ▪ Sing Tsu Fang | ▪ Suyen (Philippines)<br>▪ Golden ABC (Philippines)<br>▪ Padini Holdings Berhad (Malaysia)<br>▪ Jaspal (Thailand)<br>▪ Saha Pathana Inter-Holding (Thailand) | |
| Consumer electronics | 35 | 1 | 18 | 89 |
| | ▪ Samsung<br>▪ Nokia<br>▪ LG<br>▪ Apple<br>▪ Sony | ▪ Creative Technology | ▪ Metrotech Jaya Komunika Indonesia (Indonesia)<br>▪ Cosmic Technologies (Philippines)<br>▪ Hartono Istana Teknologi (Indonesia)<br>▪ Solid Group (Philippines)<br>▪ Samart (Thailand) | |
| Consumer health care | 27 | 3 | 15 | 298 |
| | ▪ Amway<br>▪ Herbalife<br>▪ GlaxoSmithKline<br>▪ Nu Skin Enterprises | ▪ United Laboratories<br>▪ Citra Nusa Insan Cemerlang | ▪ Kalbe Farma (Indonesia)<br>▪ Tempo Scan Pacific (Indonesia)<br>▪ Sido Muncul (Indonesia)<br>▪ Konimex Pharmaceutical Laboratories (Indonesia)<br>▪ Scotch Industrial (Thailand) | |

1 "Significant" defined as >10 percent of company's retail value.
2 Includes small companies with <$50 million retail value (excluded from multinationals/regional champion/national champion analysis).
3 Examples drawn from packaged food and hot drink categories; excludes soft drink and alcoholic beverage categories.
SOURCE: Euromonitor; McKinsey Global Institute analysis

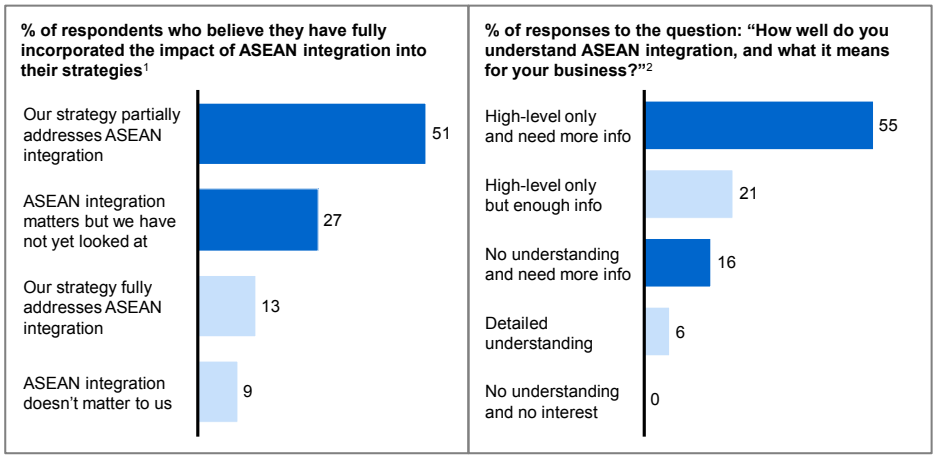
## CREATING PAN-ASEAN CHAMPIONS WILL REQUIRE COMPANIES TO RESHAPE THEIR STRATEGIES

Are firms prepared for this potential disruption in their sectors? In short, no. Many sectors remain far from integration today, and it is difficult to gauge how long it will take before the effects are felt. But it does not appear from our survey that many ASEAN firms have a sense of urgency about moving into new markets and capturing the opportunities associated with the AEC. Only 13 percent of survey respondents reported that their current strategy fully incorporates the potential impacts of integration, with the biggest share in the logistics sector and some of the lowest in the consumer/retail and telecom/ICT sectors (Exhibit 20). Among SMEs, the level of preparedness is worse: none claim ASEAN integration is fully incorporated into their strategies, about half say it is partially addressed, and over a third believe it matters to their business but they have not yet looked

at it. More than half of firms surveyed believed they need more information on ASEAN integration and what it means for their business. Because SMEs are such crucial engines of jobs throughout the region, it will be essential to provide them with education and support to ensure that they are not disproportionately affected by disruption in their sectors and are prepared to capitalize on new trade opportunities.

**Exhibit 20**

**The majority of survey respondents say their businesses are not fully prepared for integration and they need more information**




1 Based on McKinsey survey (96 respondents).
2 Based on McKinsey survey (96 respondents; 2% of respondents had no opinion).
SOURCE: McKinsey Global Institute analysis

There is no easy path for national operators to become regional champions, but a few companies, such as Charoen Pokphand Foods (CP), have succeeded. From its beginnings as a producer and distributor of animal feed in southern Thailand, CP has evolved through a strategy of investments, acquisitions, and organic growth. It first became a nationwide fully integrated agribusiness before expanding into food kiosks (Five Star), ready-to-eat products (CP brand), retail marts (CP Fresh Mart), fast-serve restaurants (CP Kitchen), super convenience retail (CP Fresh Mart Plus), food courts (CP Food World), fast-food restaurants (Chester's Food), and most recently dairy manufacturing and distribution (Meiji).

In a similar fashion, the company expanded its geographic footprint out of southern Thailand into China and the United Kingdom by 2002, Turkey by 2004, Malaysia and India by 2005, Laos and Russia by 2006, the Philippines by 2007, Taiwan by 2009, and most recently Cambodia in 2011.[92]

Chapter 3 contains a fuller discussion of what is involved in entering new consumer markets across the region.

92 "About CPF" and "Milestones," Charoen Pokphand Foods PCL website.

## TO CAPTURE THE GLOBAL TRADE OPPORTUNITY, ASEAN WILL NEED TO UPGRADE ITS MANUFACTURING SECTOR

The transitions taking place in China—including rising labor costs and the shift toward an economic model that is less reliant on exports—are reverberating throughout Southeast Asia. ASEAN has a window of opportunity to capture a greater share of global manufacturing, especially from multinationals that are seeking a lower cost base or are simply daunted by the considerable challenges of doing business in China.[93] The World Bank ranks China 96th globally for ease of doing business, far below Singapore (which actually tops the list), Malaysia (6th), and Thailand (18th).[94]

FDI trends are already starting to reflect these changing dynamics. Multinationals have a growing awareness of ASEAN's value as a base of operations. Foreign direct investment in ASEAN has boomed, surpassing its pre-crisis levels. A recent survey revealed that 17 percent of ASEAN businesses themselves plan to shift investment or business from China into their own region; respondents also identified Indonesia as the most attractive country for new business expansion, followed by Vietnam, Thailand, and Myanmar.[95]

In addition, recent tensions between China and Japan have caused a surge of Japanese FDI into ASEAN. Investment from Japan into ASEAN has steadily risen from less than $1 billion in 2003 to more than $23 billion in 2013. Over the same period, investment from Japan into China has seen much slower and less reliable growth, rising from approximately $4 billion in 2003 to just over $9 billion in 2013.[96] In a recent survey, more than half of Japanese firms that had left China stated that they had relocated operations to ASEAN countries (notably Vietnam and Thailand); trade and wholesale, textiles, clothing, electrical equipment, and metals production were the most affected sectors.[97] Of course, China is not only a competitor for ASEAN; it is also a customer. In 2012, ASEAN's trade with China accounted for 13 percent of its $2.2 trillion total trade.[98]

Completion of the AEC can continue to build this momentum. The streamlining of procedures and regulations that will result from ASEAN's integration will both deepen intra-regional trade and allow cross-border production networks to develop. In addition, it will have positive spillover effects on ASEAN's ability to attract multinationals and assume a greater role in global value chains. One recent study found that a 1 percent increase in exports of intermediate goods between ASEAN countries can lead to a 2.2 percent increase in FDI into the ASEAN-5 nations.[99] The presence of these operations will add jobs that can continue to raise living standards.

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93 See, for example, Thomas M. Hout and Pankaj Ghemawat, "China vs. the world: Whose technology is it?" *Harvard Business Review*, December 2010; *Global competitiveness report 2013–2014*, World Economic Forum, September 2013.

94 Ease of Doing Business index, World Bank, June 2013.

95 *ASEAN business outlook survey 2014*, American Chamber of Commerce Singapore and the US Chamber of Commerce, August 2014.

96 Japan External Trade Organization (JETRO), prepared from "Balance of Payments Statistics" (Ministry of Finance, Bank of Japan).

97 Ibid.

98 Trade with China calculated as the sum of ASEAN-China exports plus ASEAN-China imports as a percent of ASEAN total trade.

99 *ASEAN long view: New pistons for a growth engine*, Citi Research, June 2014.

To realize this potential, ASEAN will need to take a long-term view toward building a competitive manufacturing sector. Its less developed economies, in particular, will need to improve productivity and cost efficiency. For ASEAN's higher-income and more developed economies, the challenge is to transition to more value-adding activities. The entire region will need to provide a stable macroeconomic and political environment, build world-class infrastructure and logistics networks, and intensify its focus on workforce skills.

### Building solid foundations for a globally competitive manufacturing sector

The availability of low-cost labor in countries such as Cambodia, Indonesia, Laos, Myanmar, and Vietnam can be a competitive advantage. Average costs for factory labor are about $7 a day in Vietnam and $9 in Indonesia, far lower than the $28 average in China (which has posted a 19 percent compound annual growth rate since 2007). However, while labor costs may be low in these countries, the output per worker is also weak, which undermines this advantage. In 2012, average labor productivity in Vietnam's manufacturing sector was only about 7 percent of that in China. These countries will have to focus on boosting productivity in order to lift the wages of factory workers in the future while remaining competitive.

To compare ASEAN economies with China, we calculated the ratio of daily output to wages (Exhibit 21). Vietnam's ratio of 2.4 lags behind the other ASEAN nations in our analysis and is far below China's ratio of 8.7. This gap is narrowing as the pace of China's wage growth outstrips productivity, but ratios in some ASEAN member states (particularly Vietnam and Thailand) have also been slipping. In 2012, Singapore was the only ASEAN nation in our analysis to surpass China's ratio.[100] These averages, of course, mask important differences in the sector mix of these countries and differences in productivity among firms in a sector, but they nonetheless point to the broader productivity challenge facing the region.

In addition, the region's customs and logistics costs remain far higher than international benchmarks. As of 2014, it costs about $2,000 to ship a container from the Thai border to Yangon, for example, but only $500 to ship a similar container from the Thai border to Bangkok, a substantially longer distance. Domestic logistics chains have ample room for improvement (Exhibit 22).[101]

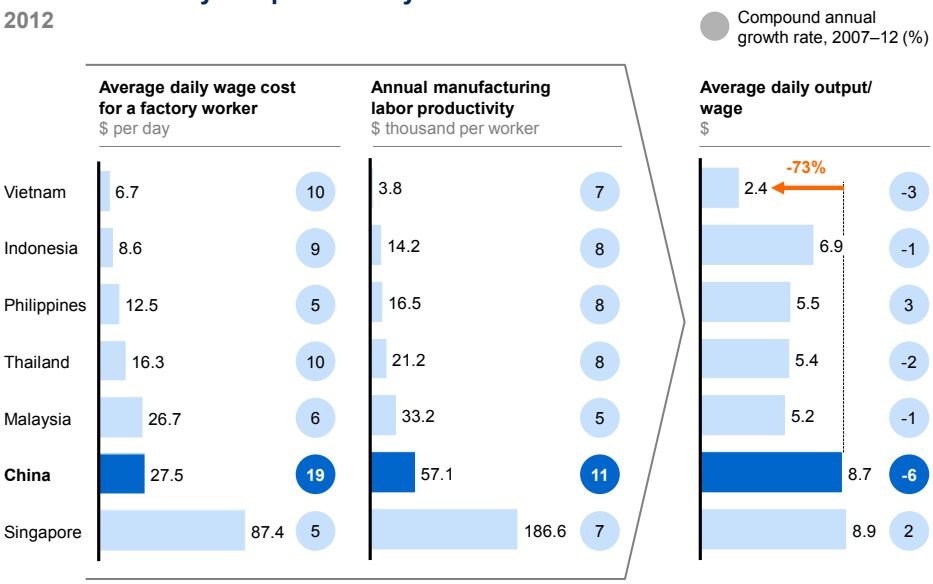
100 The ratio of daily output to wages is likely to have high variance for different sectors across countries.

101 Dwight Perkins, *Industrial policy reform in Myanmar*, Ash Center for Democratic Governance and Innovation at Harvard Kennedy School and Rajawali Foundation Institute for Asia, April 2012; Pitch Pongsawat, *Border partial citizenship, border towns, and Thai-Myanmar cross-border development: Case studies at the Thai border towns*, University of California, Berkeley, 2007.

## Exhibit 21

### ASEAN's labor costs are lower than China's, but this competitive advantage is undermined by low productivity

2012



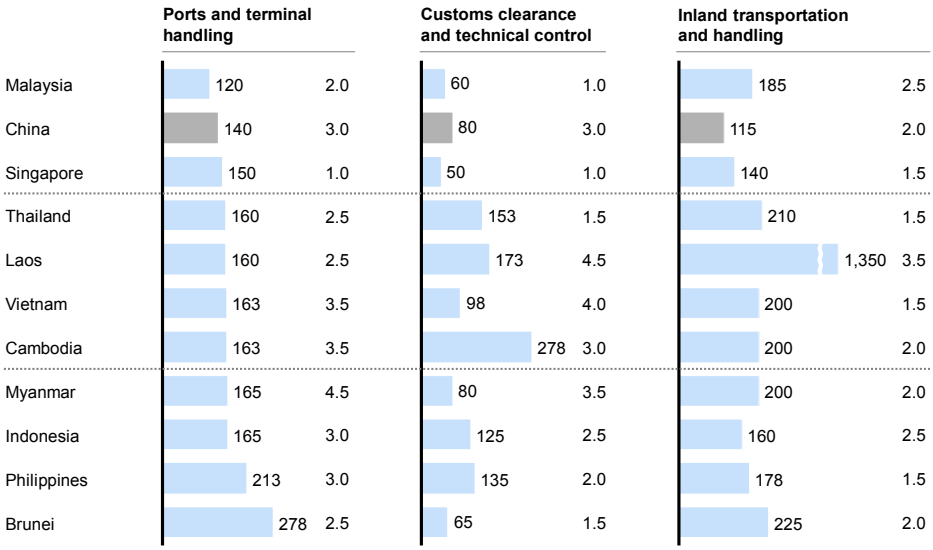

NOTE: Brunei, Cambodia, Laos, and Myanmar not included due to lack of available data. Analysis assumes Monday-Friday work and 4 weeks off work per year for all countries (combination of leave allowances and public holidays).

SOURCE: IHS; Statistics Indonesia; Bank of Thailand; Department of Statistics Malaysia; SingStat; Philippines Statistics Authority; General Statistics Office Vietnam; National Bureau of Statistics of China; Ministry of Human Resources Malaysia; McKinsey Global Institute analysis

## Exhibit 22

### ASEAN's logistics networks are competitive on speed but are often more expensive

Cost, 2014 ($); days[1]




1 All cost and days units are an average of import and export.

SOURCE: Doing Business Survey, World Bank; McKinsey Global Institute analysis

Logistics costs partly reflect the widely varying state of the region's infrastructure. The World Economic Forum ranks Singapore fifth in the world for the overall quality of its infrastructure, while Malaysia ranks 25th. Thailand (61st) and Indonesia (82nd) fall further down the ranks. Myanmar, which has particularly acute gaps as it emerges from decades of isolation and stagnation, falls near the bottom of the global rankings at 146th.[102] The World Bank ranks only four ASEAN countries in the top quartile of its global rankings for logistics infrastructure: Singapore, Brunei, Malaysia, and Thailand. Notably, Indonesia and the Philippines are ranked 56th and 75th, respectively.[103] None of the factory operators we interviewed in Myanmar had a reliable electricity supply; most have grid power for only four to five hours a day and must use generators to supply power for an additional four to five hours, which leads to unnecessary costs and low asset utilization, eroding any competitive advantage from low labor costs. Productivity remains weak because most factories can operate only daily single shifts of eight to nine hours rather than the usual industry practice of two or three shifts per day.[104]

ASEAN officials have recognized that infrastructure is critical to economic growth and are beginning to address the region's investment needs. The ASEAN Infrastructure Fund's total lending commitment through 2020 is expected to be approximately $4 billion.[105] However, we estimate core infrastructure requirements (excluding housing) to be around $3.3 trillion through 2030. Addressing this shortfall will require a radical shift in financing and infrastructure productivity, as discussed more fully in Chapter 3.

Singapore, Malaysia, and Indonesia have well-developed industry supply and distribution networks, but Myanmar, Vietnam, and Cambodia still face hurdles in establishing real value chains.[106] Governments will have to make strategic decisions about which sectors show the greatest promise and target their economic development efforts accordingly, as Thailand has done in the automotive sector (see Box 5, "The Thai automotive hub").

102 *Global competitiveness report 2013–2014*, World Economic Forum, September 2013. Its infrastructure ranking assesses overall infrastructure as well as the quality of roads, railroads, ports, airports, and electricity supply; available airline seat kilometers; mobile telephone subscriptions; and fixed telephone lines.

103 Logistics Performance index 2014, World Bank. The infrastructure index considers the quality of trade- and transport-related infrastructure, e.g., ports, railroads, roads, and information technology. The logistics index is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade. This is supplemented with quantitative data on the performance of key components of the logistics chain in each country.

104 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

105 *Facts and data about Southeast Asian infrastructure*, Asian Development Bank, May 2012.

106 *Global competitiveness report 2013–2014*, World Economic Forum, September 2013.

### Box 5. The Thai automotive hub

As Southeast Asia's manufacturing hub for car and components, Thailand has been dubbed "Detroit of the East."[1] The country's plants turned out some 2.5 million cars in 2013, and more than a million vehicles were exported in 2012 and in 2013.[2] Although growth has stalled in 2014 in the wake of Thailand's political unrest, the industry enjoys solid long-term prospects as incomes rise and consumers across the region can afford cars for the first time. Thailand's success can be attributed to strong government support and a relatively low-cost but skilled workforce.

The government helped this industry cluster take root by attracting foreign carmakers with a low corporate tax rate of 20 percent. It also offered incentives and liberalized foreign ownership rules, and it temporarily bolstered domestic demand by offering tax rebates to first-time car buyers.[3] Thailand also invested in strategic supporting infrastructure. In the mid-1980s, it undertook the Eastern Seaboard Development Plan, which included 16 major infrastructure projects covering seaports, highways, railways, water pipelines, reservoirs, and heavy industry complexes. The role of foreign investment was critical, with most of this work being financed by Japan through low-interest loans.[4]

The automotive industry particularly lends itself to production networks and industrial clusters. Vehicles require many parts and components, and different models require parts with varying properties, including color and styling. This complexity, combined with the bulkiness of the inputs, makes it advantageous for suppliers to locate in close proximity to final assembly lines, as short distances reduce reaction times in logistics. Multinationals including Toyota, Honda, Ford, Nissan, Mitsubishi, BMW, and Mazda form the foundation of Thailand's automotive industry. When they entered the market, their presence attracted suppliers, and they also provided technical advice and support to local parts makers.[5] This ecosystem has wider spillover effects; in fact, most of the FDI in Thailand's rubber and plastics industry can be attributed to greenfield investment in tire manufacturing.[6]

1 "Detroit of the East," *The Economist*, April 4, 2013.

2 Duangjai Asawachintachit, "Thailand: Automotive hub of Asia," presentation, Thailand Board of Investment, Bangkok, Thailand, April 28, 2014; Edward Barbour-Lacey, *Thailand auto market accelerates into overdrive*, ASEAN Briefing, October 29, 2013.

3 Ibid.

4 Ponciano Intal Jr. et al., *ASEAN rising: ASEAN and AEC beyond 2015*, Economic Research Institute for ASEAN and East Asia, January 2014.

5 Ibid.

6 Yuphin Pongthong, "Bridgestone plans new tyre plant," *The Nation* (Thailand), May 7, 2013.

To become more competitive, the region will also have to focus on developing its human capital and workforce skills. In Indonesia and Myanmar alone, we project an undersupply of nine million skilled and 13 million semi-skilled workers by 2030.[107] In 2010, only 5 percent of Myanmar's workers had tertiary and higher education credentials, and only 15 percent had finished secondary education. Only 30 percent of workers in Vietnam and Thailand have completed secondary education; in Indonesia, the share is almost 50 percent; and in Malaysia, it is about 60 percent.[108] The average number of years of schooling across ASEAN member states is seven, but the spread ranges from approximately four years in Myanmar and Cambodia to approximately ten years in Singapore and Malaysia.[109] Employers in several ASEAN countries complain that many workers are not adequately prepared for jobs and that vocational and technical training is lacking. One 2013 survey found that skills shortages were the second-biggest barrier to growing a regional business in ASEAN.[110] Policy makers will need to close the looming skills gap by raising the standard of teaching and teacher training, developing curricula in tune with the needs of the economy, and creating flexible new education pathways using technology (such as Web-based interactive courses). See Chapter 4 for more discussion on improving access to education and learning outcomes through the use of technology.

### Making the shift to higher-value-added manufacturing

Multiple ASEAN countries are engaged in relatively basic manufacturing; they have not yet reached the stage of economic development in which they begin to produce more intricate products. Using a measure of product complexity that incorporates the uniqueness and diversification of products exported, recent analysis has shown that production within many ASEAN countries is still in the relatively low-complexity stage (Exhibit 23).[111] For example, 97 percent of Cambodia's exports fall within the lowest quintile of product complexity. Both Cambodia and Laos are among the six lowest performers in economic complexity among the 124 countries indexed.[112]

Given the education challenges across most of Southeast Asia, it comes as no surprise that the region's innovation capacity is currently quite limited (with Singapore as a notable exception). In 2010, ASEAN's patent applications accounted for less than 2 percent of those filed by China or Japan.[113] Building an ecosystem for innovation—with research institutions, university initiatives, international partnerships, and greater digital connectivity—will be crucial to

107 *The archipelago economy: Unleashing Indonesia's potential*, McKinsey Global Institute, September 2012; and *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

108 *World development indicators*, World Bank, 2010.

109 *Human development report 2014—Sustaining human progress: Reducing vulnerabilities and building resilience*, United Nations Development Programme, July 2014. Mean years of schooling calculated as an average of boys and girls from 2002 to 2012.

110 *Riding the ASEAN elephant: How business is responding to an unusual animal*, Economist Corporate Network, March 2013. "Shortages of the right type of workers" scored 3.8 in response to the question: "How serious are these challenges to growing regional business in ASEAN?" The question was scored from 1 (not serious) to 5 (extremely serious).

111 Based on research by Jesus Felipe et al., "Product complexity and economic development," *Structural change and economic dynamics*, volume 23, issue 1, March 2012.

112 Myanmar and Brunei are not included in the analysis.

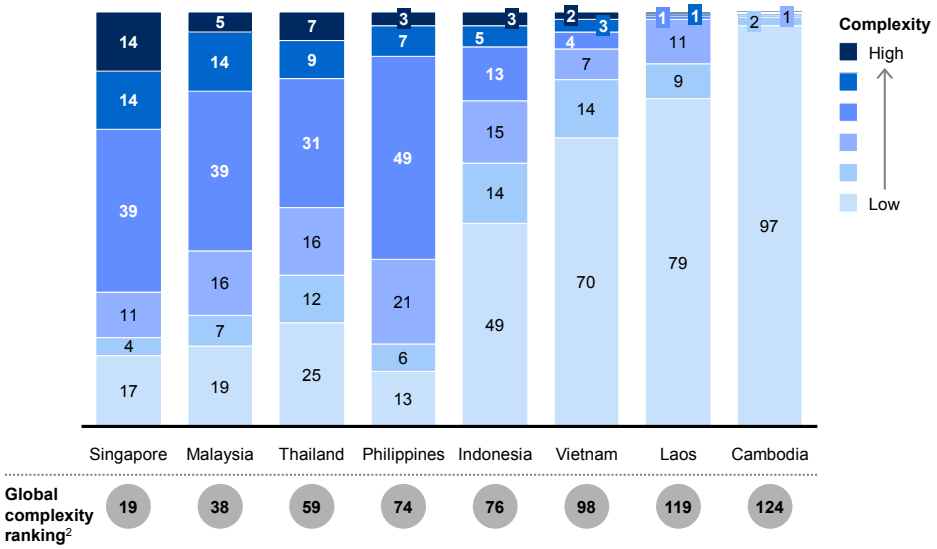
113 *World development indicators*, World Bank, 2010, for patent applications filed through the Patent Cooperation Treaty procedure or with a national patent office for exclusive rights for an invention.

sustaining economic growth, and the presence of multinationals can spur some important spillovers in knowledge and skills.

**Exhibit 23**

**Only Singapore and Malaysia rank among the world's top 50 countries for the economic complexity of their exports**

Economic complexity[1] of exports
% distribution across complexity levels




1 Economic complexity considers the country's diversification of exports and the ubiquity of those exports (i.e., the number of countries that export that product). Data are based on averages of 2001–07, but experts suggest complexity distribution in ASEAN countries remains directionally consistent in 2014. The most complex products are in machinery, chemicals, and metals, while the least complex products are raw materials and commodities, wood, textiles, and agricultural products.
2 Ranking out of 124 countries indexed. Brunei and Myanmar not included in index.
NOTE: Numbers may not sum due to rounding.
SOURCE: Jesus Felipe et al., "Product complexity and economic development," in *Structural change and economic dynamics*, 2012; McKinsey Global Institute analysis

While there is no one-size-fits-all formula for making this transition to higher-value, more complex production, international examples provide a number of insights about what works:

- **Collaborate with partners on innovation and technology adoption.** Companies that partner with universities or research centers can engage in more sophisticated R&D that leads to product and process innovation. The German Fraunhofer research institutes, for example, have proven effective in working with medium-sized businesses on research that has led to commercially viable applications such as the MP3 audio format. The United Kingdom has tried to replicate these centers through the creation of Technology and Innovation Centers.[114] The United States is pursuing a National Network for Manufacturing Innovation to accelerate the development of new, globally competitive products.[115] There are also many examples in emerging economies. Taiwan's Industrial Technology Research Institute focuses on six high-technology areas in which it hopes to establish the country as a pioneer. In Israel, the Industry Center for R&D helps companies utilize emerging technologies to maximize supply-chain performance and helps

114 *Future champions: Unlocking growth in the UK's medium-sized businesses*, Confederation of British Industry, October 2011.

115 *Snapshot: National network for manufacturing innovation*, Advanced Manufacturing National Program Office.

researchers obtain intellectual property rights. Israel's life sciences sector, which emphasizes academic and international collaboration, has experienced especially dramatic growth; it consisted of 186 companies prior to 1996, and today there are around 1,000.[116] And in Singapore, the Science and Engineering Research Council partnered with German industry players to form the A*STAR Capabilities Automotive Research consortium, aimed at driving technological innovation in the automotive sector.[117] Since many ASEAN countries are far from the technology frontier in some sectors, there could be significant benefit in building capabilities for adapting foreign technologies to the local context. For example, in agriculture, the Brazilian Agricultural Research Corporation, known as Embrapa, has pioneered more than 9,000 technology projects, including the design of a tropical strain of the soybean and other crops that can thrive in Brazil's climate.[118]

- **Establish clusters to drive growth.** Economists have long noted the potential agglomeration benefits that come from density of economic activity.[119] Thailand's automotive sector is a classic example of this phenomenon. One specific type of cluster, export processing zones, has now been established across ASEAN. The Batam Free Trade Zone (Singapore-Indonesia), the Southern Regional Industrial Estate (Thailand), the Tanjung Emas Export Processing Zone (Indonesia), the Port Klang Free Zone (Malaysia), the Thilawa Special Economic Zone (Myanmar), and the Than Thuan Export Processing Zone (Vietnam) are at varying stages of development but are all expected to drive export growth in the future.[120] Our global research suggests several relevant principles for cluster development, including a defined focus on specific industries or sectors and final markets, high-quality transport links, a favorable regulatory regime (such as one-stop shops for taking out leases, making utility connections, and so on), and a strong performance-based governance model.

- **Boost management quality.** In addition to the broader commitment to education required to build a skilled workforce, management quality needs more focus. Past McKinsey work and academic literature have found that this is a strong driver of firm-level productivity.[121] Many ASEAN countries have significant gaps. For example, in Myanmar, there has been only limited adoption of proven best-practice techniques in areas such as product

116 *Life sciences in Israel: Bridging scientific breakthroughs and successful businesses*, Ministry of Economy, State of Israel.

117 "Partnerships," accessed on website for Singapore Agency for Science, Technology and Research, www.a-star.edu.sg/partnerships.aspx.

118 Elcio Perpétuo Guimarães et al., eds., *Agropastoral systems for the tropical savannas of Latin America*, International Center for Tropical Agriculture (CIAT) and Brazilian Agricultural Research Corporation (Embrapa), January 2004.

119 Stuart S. Rosenthal and William C. Strange, "Evidence on the nature and sources of agglomeration economies," in *Handbook of urban and regional economics*, 1st ed., volume 4, J. V. Henderson and J. F. Thisse, eds., Elsevier, 2004.

120 *Ten of Asia's most dynamic export processing zones that you've never heard of*, Asia Briefing, April 24, 2014. These export processing zones are at various stages of development. For example, construction of the Thilawa Special Economic Zone in Myanmar is scheduled to be complete in 2015, while the Batam Free Trade Zone has been in existence since 2007 and is home to more than 1,000 companies including Panasonic, Casio, Sumitomo Corporation, and Philips.

121 Nicholas Bloom and John Van Reenen, "Why do management practices differ across firms and countries?" *Journal of Economic Perspectives*, volume 24, number 1, winter 2010.

development and engineering, channel management, and operations. In about half of the factories McKinsey examined in Myanmar, less than 50 percent of the total factory floor space was used for operations, and less than one-third had separate warehouses for storing inventory.[122] Implementing best practices in these areas could improve productivity using existing capacity.

- **Become the location of choice for multinationals.** In 2006, ASEAN was home to 49 companies in the Forbes Global 2000. By 2013, that number had risen to 74. ASEAN includes 227 of the world's companies with more than $1 billion in revenue, or 3 percent of the world's total.[123] Singapore is a standout, ranking fifth in the world for corporate headquarter density and first in terms of foreign subsidiaries.[124] There is a clear opportunity for other ASEAN countries to attract even more foreign operations of multinationals and more foreign investment. This could have a number of benefits that would help ASEAN move up the value chain, as almost 80 percent of R&D expenditure is attributable to multinationals, which facilitate the transfer of skills, knowledge, and technology.[125] It is crucial for ASEAN countries to market themselves effectively as desirable places to do business, based on their unique strengths.

  A recent survey by the American Chamber of Commerce in Singapore found that respondents across ASEAN considered the size of growth opportunities, restrictions on foreign investment, input costs, infrastructure quality, and labor skills to be some of the key factors that sway their investment decisions.[126] Based on these criteria, there are widespread differences in the ability of ASEAN countries to attract investment at present (Exhibit 24). In addition to improving these critical areas, countries need a proactive and responsive investment promotion agency to market their strengths and facilitate company moves. Singapore's Economic Development Board has excelled at this throughout the years. Ireland's Industrial Development Agency has also created a high-performing organization for attracting foreign investment. For example, to "seal the deal" with Intel and address its concerns about not finding sufficient qualified engineers, the agency provided Intel with a list of 85 Irish engineers working abroad with relevant qualifications who were willing to move back to Ireland if hired by Intel.[127]

  Academic research shows that countries need to simultaneously develop a strong local base of domestic firms as suppliers and service providers in order to capture the benefits of multinationals' presence; otherwise, little of

122 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

123 McKinsey Global Institute Cityscope—Large Company database.

124 Headquarter density is the ratio of revenue of companies with revenue of $1 billion or more, with their global head office in a country, to GDP in 2010. For further details, see *Urban world: The shifting global business landscape*, McKinsey Global Institute, October 2013.

125 McKinsey estimate based on data and analysis in Rachel Griffith, Rupert Harrison, and John Van Reenen, "How special is the special relationship? Using the impact of US R&D spillovers on UK firms as a test of technology sourcing," *American Economic Review*, volume 96, number 5, December 2006.

126 *ASEAN business outlook survey 2014*, American Chamber of Commerce Singapore and the US Chamber of Commerce, August 2014.

127 Kieran McGowan (former head of the IDA Ireland), interview by Stephen McIntyre, November 5, 2004, as cited in *The Dublin International Financial Services Cluster*, Clare Boland et al., eds., Harvard Business School, May 2006.

the value added may remain in the country.[128] One good international example of this is Costa Rica's Provee program, which focuses on establishing links between multinationals and a local supplier base. Procomer, the agency that manages Provee, connects multinationals and local suppliers and provides "quality checks" on the relationships. Its aid to local suppliers entails technical assistance, manufacturing and supply-chain training, and an online portal that provides a one-stop shop for exporting support.

**Exhibit 24**

**Based on their performance in investors' top-priority areas, ASEAN markets have varying abilities to attract foreign direct investment (FDI)**

Top quartile
2nd quartile
3rd quartile
Bottom quartile

| | Top priorities for business (ranking)[1] | | | | |
|---|---|---|---|---|---|
| | Customer base[2] | Infrastructure | Labor quality | Production cost[3] | Openness to FDI |
| Malaysia | 29 | 25 | 19 | | 14 |
| Singapore | 45 | 5 | 3 | | 2 |
| Brunei | 134 | 39 | 32 | | 60 |
| Indonesia | 15 | 82 | 36 | | 61 |
| Cambodia | 95 | 86 | 76 | | 30 |
| Laos | 122 | 65 | 57 | | 31 |
| Thailand | 22 | 61 | 78 | | 21 |
| Philippines | 30 | 98 | 40 | | 86 |
| Vietnam | 39 | 110 | 95 | | 53 |
| Myanmar | 70 | 146 | 125 | | 132 |

1 Based on responses to questions in AmCham ASEAN Survey, 2014.
2 Based on size of domestic market (sum of GDP plus value of imports of goods and services, minus value of exports of goods and services, 2012).
3 Based on cost of labor and utilities; quartiled based on ASEAN countries plus China; data unavailable for Brunei, Cambodia, Laos, and Myanmar.

SOURCE: *Global competitiveness report 2013–14*, World Economic Forum, September 2013; Worldwide Governance Indicators 2013, World Bank; McKinsey Global Institute analysis

## TURNING ASEAN INTO A UNIFIED POWERHOUSE OF MANUFACTURING AND TRADE WILL REQUIRE BOTH PUBLIC AND PRIVATE EFFORTS

ASEAN has tremendous economic potential as a unified market and a global hub of production, but completing the integration process and building a competitive manufacturing sector will be a long-term project. Below is a short recap of the major priorities for accelerating progress.

### Domestic and regional policy challenges

- **Increase awareness of ASEAN.** As our firm survey showed, the majority of firms in ASEAN (particularly SMEs) have little understanding of the opportunities they could realize from integration and various trade deals. The region's governments need to collaborate with both the ASEAN Secretariat and other trading partners in awareness and outreach campaigns to win support from the business community and the broader public.

128 See, for example, Siew Yean Tham and Wai-Heng Loke, "Industrial deepening in Malaysia: Policy lessons for developing countries," *Asian Development Review*, volume 28, number 2, December 2011.

- **Accelerate progress on the areas identified as top business concerns.** While the integration process can be a long haul, particularly given the limited capacity and resources of the ASEAN Secretariat, our interviews with firms found that focusing on removing a handful of key administrative barriers that are important to businesses could release significant value and go a long way toward illustrating the benefits of integration. Policy makers should identify and go after selected quick wins.

- **Strengthen the institutional framework for integration.** The ASEAN Secretariat needs the resources to manage and monitor the integration process. ASEAN could also explore the development of stronger dispute settlement mechanisms to underpin its agreements and give force to commitments.

- **Build the foundation in manufacturing.** There is a critical need to improve competitiveness in manufacturing by addressing skills, infrastructure, logistics, and foreign investment restrictions.

- **Create the ecosystem to transition to higher-value-added activities.** ASEAN firms will need to move up the value chain in order to remain competitive as wage levels rise. To facilitate this process, governments can support R&D, educational programs, and innovation centers.

- **Focus on attracting FDI.** Multinationals can form the basis of industry clusters; they not only create jobs, but they also transfer skills and support the growth of local suppliers. Becoming the location of choice for their operations will involve creating the right set of incentives, including enhanced ease of doing business and investing. Member states will need effective government agencies to market to these companies and secure commitments.

- **Support the SME sector.** More than 95 percent of firms across ASEAN are SMEs (defined here as those with fewer than 500 employees). Collectively their contribution to economic output is between 23 and 58 percent of GDP, and their contribution to employment is as high as 97 percent.[129] It will be critical to ensure that they have access to capital so they can scale up and respond to new market opportunities and to the competition posed by multinationals. A significant number of SMEs in Southeast Asia rely on their own resources for startup capital and business expansion; they may lack awareness of financing resources and programs available from commercial banks and other sources. Their access to finance is currently undermined by factors such as limited credit information, the absence of a central collateral registry, stringent collateral requirements, and a lack of a legal framework to support alternative channels such as microfinancing and angel investing.[130]

129 *ASEAN SME policy index 2014: Towards competitive and innovative ASEAN SMEs*, Economic Research Institute for ASEAN and East Asia research report number 2012–8, in cooperation with OECD, March/June 2014.

130 Ibid.

### Challenges and opportunities for businesses

- **Work with policy makers to shape the integration framework in specific sectors.** Multinationals and regional companies alike need to work more closely with governments to help accelerate progress within their sectors. In particular, the removal of non-tariff barriers and harmonization of standards and regulations require technical and commercial expertise.

- **Act decisively to enter new markets as integration progresses.** Our survey and interviews reveal that many companies have not fully incorporated integration or emerging trade deals into their strategies. But staking out a position early as markets start to open can confer a competitive advantage that lasts for years to come. Companies will need to recognize and respond to changing competitive dynamics, identify new markets and consumer demographics, and seize opportunities for cost savings.

- **Extract the maximum benefit from existing frameworks.** Our interviews reveal a lack of awareness across sectors about the frameworks that currently exist. For example, the average usage rate for the ASEAN free trade area is still only 50 percent. Many issues contribute to the low utilization rate, one of which is simply a lack of awareness of the benefits. Despite the challenges that exist for companies in staying up to date on developments, collaboration within industry peers and with governments and regulators is crucial to progress.

- Regionalize your business. Explore options for establishing pan-regional operations that build on the differing competitive advantages available in ASEAN's diverse member states, which range from low-cost labor to intermediate manufacturing capabilities to more sophisticated logistics and services.

□ □ □

As the AEC becomes a reality and China continues the ongoing process of rebalancing its economy, ASEAN has a window of opportunity to capture a greater share of global trade flows. If the region can make its integration plan work on the ground and build a more competitive manufacturing sector, ASEAN could be poised to become the next "factory of the world" while accelerating growth and achieving broader prosperity.


Chinese

# 3. Urbanization: New markets and new challenges

Southeast Asia's economic rise is being fueled by the booming growth of its cities. Today just over one-third of ASEAN's population lives in cities, and these urban areas account for two-thirds of the region's GDP. More than 90 million people are expected to move to cities by 2030, bringing the urban share to almost 45 percent of the population and 76 percent of GDP.

This shift has the potential to be a game changer for Southeast Asia, just as urbanization has been an inextricable part of the rapid economic transformations taking place in China and India. More than 80 cities in ASEAN countries could achieve annual economic growth rates above 7 percent between now and 2030. Many of these are outside the major capitals that have historically powered the region's growth.

As millions migrate from the countryside to cities, leaving behind rural agriculture for urban jobs, their incomes tend to rise—and this trend is producing a new wave of consumers with considerable spending power. Already some 81 million households in ASEAN countries are part of the consuming class, with incomes exceeding the level at which they can begin to make significant discretionary purchases.[131] That number could double to 163 million households by 2030, making ASEAN a pivotal consumer market of the future.

Urbanization is already generating economic growth, but many of the region's cities are struggling to provide adequate housing, infrastructure, and services to meet the needs of a surging population. ASEAN will need almost $7 trillion of infrastructure and real estate investment by 2030, the majority of which will be required to support growing cities. Governments will need to make the most of this investment by developing more rigorous approaches to project selection, delivery, and maintenance of existing assets. Global studies suggest that taking a more strategic approach could reduce infrastructure costs by 40 percent.[132]

Cities are exceedingly complex systems, and managing their rapid expansion is no small task. The region has a window of opportunity to set its smaller cities on a more sustainable development path and to address the growing pains of its largest cities before they become intractable problems. Cities, with the support of regional and national governments, have to position themselves to capture the full economic benefits of urbanization. This chapter highlights a number of promising examples from across the region to illustrate innovative urban planning and city management solutions.

If Southeast Asia can manage urban growth with vision and foresight, it can make significant strides in the five dimensions of economic progress outlined earlier in this report. Productivity will increase as the population shifts from rural to urban

131 "Consuming class" households defined as those with annual income of >$7,500 (in 2005 real purchasing power parity terms).

132 *Infrastructure productivity: How to save $1 trillion a year,* McKinsey Global Institute, January 2013.

employment, while rising incomes and greater access to public services such as health care and education build inclusiveness. Urban growth is spurring major new investment in infrastructure. Not only will transportation systems and digital networks improve regional connectivity, but the region has an opportunity to build foundational systems that can improve its resilience to the effects of climate change. Lastly, cities bring together businesses and talent; they are the hotbeds of innovation, which improves agility.

Urbanization will be a critical factor in propelling ASEAN member states to the next rung on the ladder of economic development. Based on the job mix effect, economies of scale, and the impact of infrastructure and real estate spending, we project that the continued growth of cities could add some $520 billion to $930 billion to the region's annual GDP by 2030.[133]

## ASEAN IS UNDERGOING A MASSIVE WAVE OF URBANIZATION

Today, only 36 percent of ASEAN's population is urban, still well below the shares in North America (77 percent), Western Europe (63 percent), or Central and Latin America (55 percent).[134] Although Southeast Asia is home to a number of the world's largest and most densely populated cities, the region's urbanization trend is very much ongoing—and many of the economic and societal changes associated with it will reverberate for years to come.

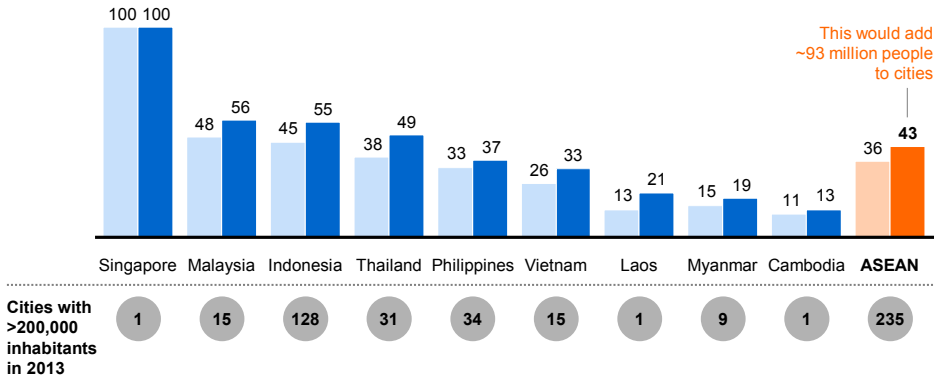
The rise of cities has gone hand in hand with strong economic growth in China, India, and elsewhere across the developing world. Similar forces are at work across Southeast Asia, where urban areas account for more than 65 percent of the region's GDP. This expansion shows no sign of slowing: by 2030, we expect that these cities will attract over an additional 90 million people and generate more than 75 percent of GDP (Exhibit 25).

**Exhibit 25**

**More than 90 million people are expected to move to Southeast Asia's cities by 2030**

**Share of country population living in cities of more than 200,000 inhabitants, 2013–30[1]**

%




1 Brunei not included as the country has no cities with population >200,000.
NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute Cityscope database; national statistics offices; McKinsey Global Institute analysis

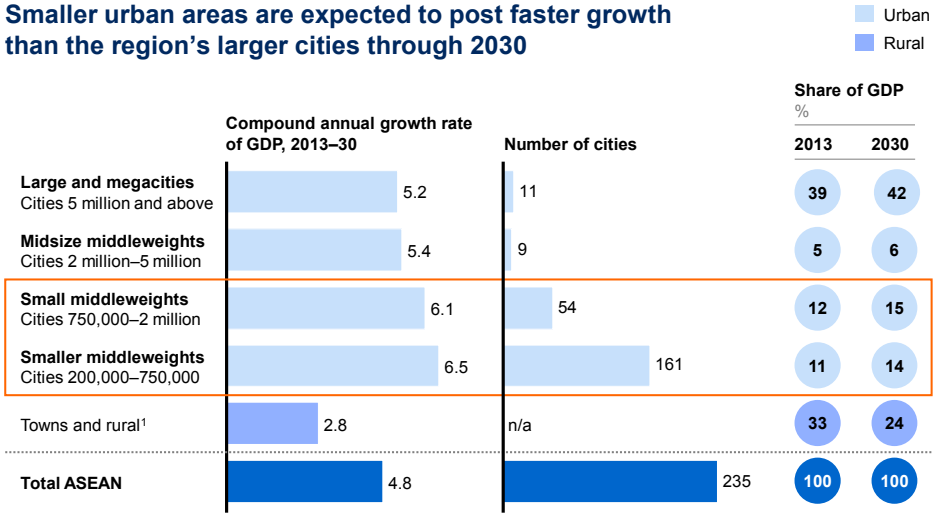
133 The low end of this range is based on the region maintaining the 0.6 percent urbanization rate it experienced from 1994 to 2012; the high end is based on a future urbanization rate of 1.2 percent, which is in line with the experience of other regions that have urbanized rapidly. See the technical appendix for more detail on the methodology.

134 "Urban" defined as population living in cities with a population greater than 200,000.

However, ASEAN's urbanization trend is about much more than the continued growth of its largest cities. The region has 215 smaller "middleweight" cities that are growing faster than its well-known capitals, and they are expected to drive almost 40 percent of the region's GDP growth through 2030 (Exhibits 26 and 27). Eighty-nine of the region's cities are expected to experience real annual GDP growth of more than 7 percent, and only two of these are large cities with populations exceeding five million (Yangon and Manila).

## Exhibit 26

### Smaller urban areas are expected to post faster growth than the region's larger cities through 2030

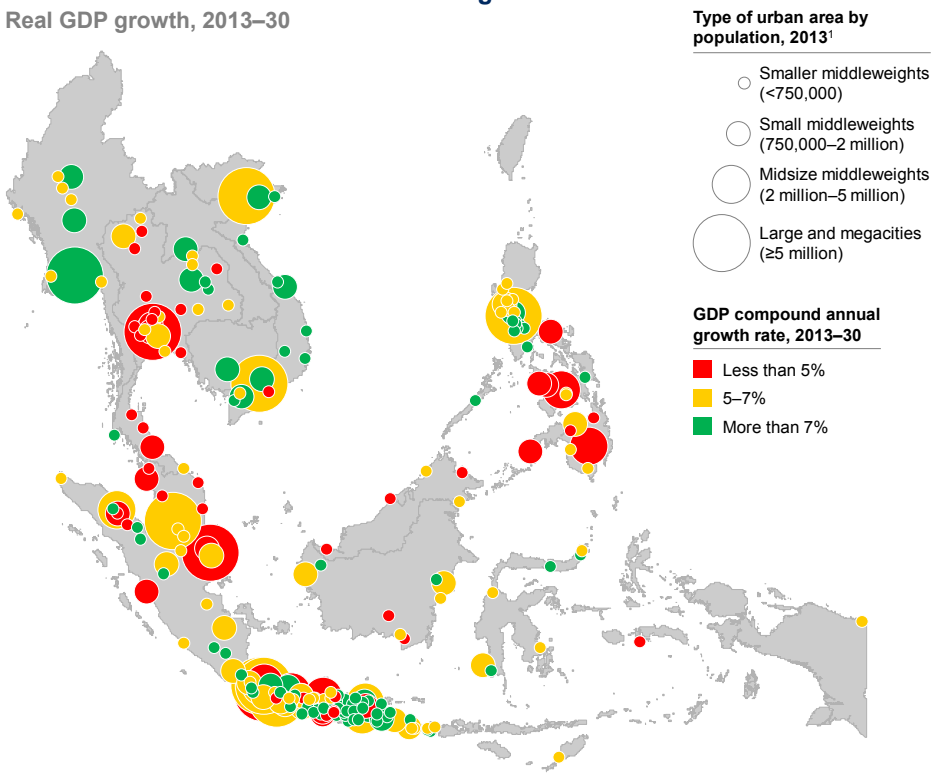



1 Includes cities with fewer than 200,000 inhabitants.
NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute Cityscope database; national statistics offices; McKinsey Global Institute analysis

## Exhibit 27

### Most of Southeast Asia's cities are small and midsized, and these urban areas will drive future economic growth

Real GDP growth, 2013–30




1 Includes cities with more than 200,000 inhabitants.
SOURCE: McKinsey Global Institute Cityscope database; IHS; local statistics offices; McKinsey Global Institute analysis

The continuing tide of urbanization will reshape society across Southeast Asia. It is ultimately more efficient to deliver infrastructure and public services to a more densely concentrated population, and as a result, urbanization may help the region make solid gains in educational attainment and access to health care. But, especially in the largest cities, governments will find it challenging to keep pace with the demand for affordable housing, water and power infrastructure, transit systems, schools, and hospitals. Encouraging smart growth in the region's small and midsize urban areas, where it is easier to build the necessary physical and social infrastructure, can help to alleviate some of the stresses on the region's largest cities; it can also ensure that economic clout, job opportunities, and social services are more evenly distributed throughout multiple regions.

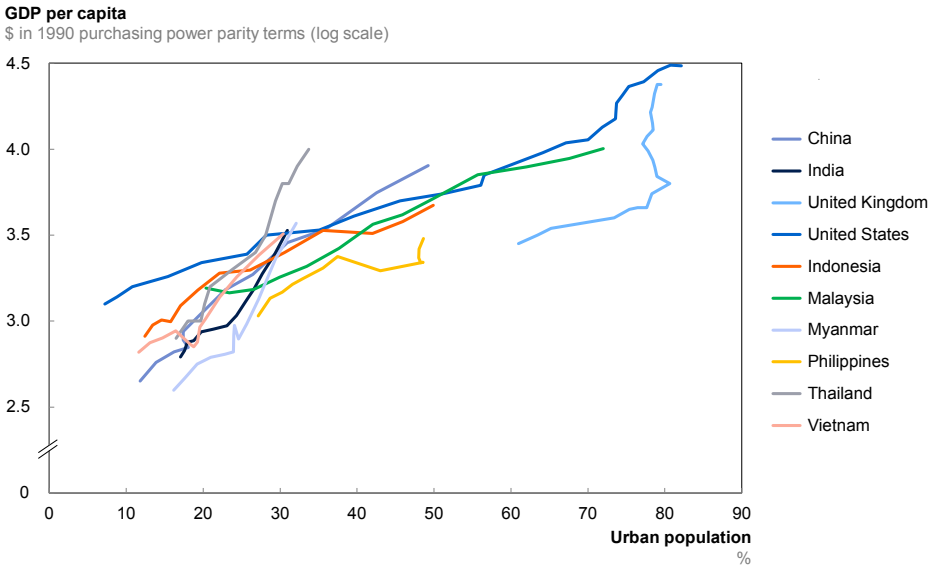
## URBANIZATION CAN DRIVE ECONOMIC GROWTH AND TRANSFORM SOCIETIES ACROSS THE REGION

Urbanization is a crucial driver of economic growth (Exhibit 28). In fact, no country has ever climbed from low-income to middle-income status without a significant population shift into cities.[135] There are several forces at work here, starting with the job mix effect. As people leave behind farms for jobs in urban manufacturing and services, they become more productive and earn higher wages, which raises living standards. This effect is felt not only in the city but also in the countryside, as new urban residents tend to send remittances to their families (see Box 6, "The connections between urban and rural development").

**Exhibit 28**

**Urbanization is associated with rising prosperity**

**Urban share vs. GDP per capita, 1950–2010**




SOURCE: United Nations World Population Division; Angus Maddison database; census reports of England and Wales; Honda in Steckel & Floud,1997; Bairoch, 1975; McKinsey Global Institute analysis

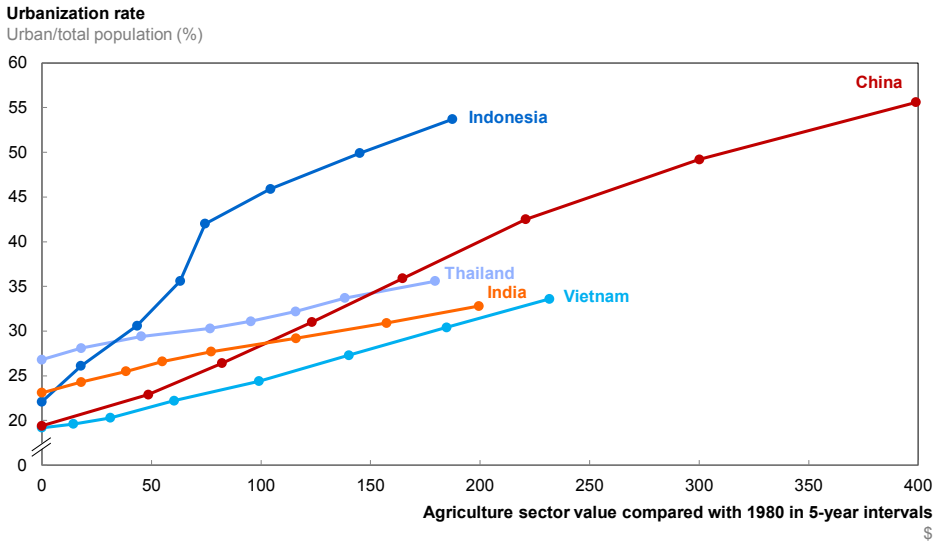
135 Michael Spence, preface to *Urbanization and growth*, Michael Spence, Patricia Clarke Annez, and Robert M. Buckley, eds., Commission on Growth and Development, 2009.

## Box 6. The connections between urban and rural development

As populations continue to migrate from the countryside to cities in search of opportunities, economies across the region are modernizing and industrializing rapidly. This shift toward a more mobile and less agrarian society is not always painless for individuals and families—nor is it a simple story of cities making economic gains at the expense of rural areas. In fact, urban growth can have positive spillover effects that strengthen the agriculture sector and bolster the rural economy (Exhibit 29).

### Exhibit 29

**In Asia, increasing urbanization has gone hand in hand with large increases in the value of the agricultural sector**




NOTE: First data point per country, 1980; last data point per country, estimated for 2015.

SOURCE: IHS; *World population prospects: The 2010 revision*, United Nations, 2011; national statistics offices; McKinsey Global Institute analysis

Two particularly important dynamics are at play.[1] First, as the initial migrants leave a rural community for jobs in the city, they often send remittances back to family members in the countryside, creating a flow of capital that farmers can direct toward purchasing better inputs and machinery. As agricultural productivity increases, it frees up more farm workers, many of whom will opt to try out life in cities, setting off a mutually beneficial cycle. Second, when people migrate from rural to urban areas, their diets tend to improve along with their incomes. This boosts demand for higher-value and more perishable crops. With fewer people living directly off the land, the quantity of traded crops increases. The value of agricultural production tends to rise most strongly in areas near fast-growing cities. Previous MGI research on India has found that the per capita GDP of the rural population living close to cities is 10 to 20 percent higher than that of those who live in rural areas farther away from urban centers.[2]

1 For further discussion on this point, see, for example, Hermann Waibel and Erich Schmidt, *Feeding Asian cities: Food production and processing issues*, presented at the CityNet, AFMA, FAO Regional Seminar on "Feeding Asian Cities" in Bangkok, Thailand, November 27–30, 2000; Cecilia Tacoli, *Rural-urban linkages and pro-poor agricultural growth: An overview*, prepared for OECD DAC POVNET, Agriculture and Pro-Poor Growth Task Team, Helsinki Workshop, June 17–18, 2004.

2 *India's urban awakening*, McKinsey Global Institute, April 2010.

Beyond changes in employment, cities offer the critical mass and density for economies of scale and network effects. The productivity of a city with 200,000 people is, on average, 3 to 8 percent higher than that of a city with 100,000 residents.[136] Businesses have access to a broader base of customers, suppliers, employees, and capital, and their proximity to one another leads to knowledge spillovers. Cities represent growth markets for infrastructure, transportation, health care, education, housing, and recreation. Large cities are also magnets for talent, including workers with greater levels of skills and education. Additionally, governments can provide basic services more effectively and to larger populations in cities. Previous McKinsey research has found that delivering a number of basic services, such as piped water, to dense urban areas is up to 50 percent cheaper than delivering basic services to sparsely populated areas.[137]

All this will lead to a larger and more affluent ASEAN urban population with greater spending power. These consumers will drive demand for both new and existing products and services, presenting a huge opportunity for businesses.

But city, regional, and national governments have to take active steps to capture this economic potential. On a basic level, it takes well-planned infrastructure to sustain both the growing populations and the businesses that provide jobs. Without the right underpinnings, cities can experience a downward spiral as they grow. In Latin America, for example, inadequate infrastructure and planning has led to urban ills such as congestion, pollution, damagingly high levels of informal economic activity, and a failure to generate enough high-productivity jobs to raise the living standards of an expanding labor force.[138] Beyond delivering basic infrastructure and social services, however, cities that take a more holistic approach to defining an attractive value proposition, developing sustainably, and insisting on responsible and committed leadership can become vibrant centers that attract talent and businesses.

### Imagining urban Southeast Asia in 2030

Urbanization will not only transform the region's economy; if growth is well managed, it can also be a force for societal change and progress in human development. The access to health care, safe drinking water, and sanitation afforded in cities could lower mortality rates. By 2030, if Southeast Asia stays on the trajectory that has been set over the past decade, the region's average life expectancy could increase from 72 to 77 years.[139]

The demographic nature of countries is also likely to change. Greater economic opportunities for women could lead to greater gender equality and a decline in birthrates. By 2030, most countries (except for Cambodia and the Philippines) will have fertility rates of less than 2, which is below the replacement level and would eventually lead to aging populations. As fertility rates drop, the size of the family unit shrinks. Household sizes also become smaller as young adults leave their extended families for cities. Young and unmarried migrants form alternative living

136 Stuart S. Rosenthal and William C. Strange, "Evidence on the nature and sources of agglomeration economies," in *Handbook of urban and regional economics*, 1st ed., volume 4, J. V. Henderson and J. F. Thisse, eds., Elsevier, 2004.

137 *Urban world: Cities and the rise of the consuming class*, McKinsey Global Institute, June 2012.

138 *Urban world: Mapping the economic power of cities*, McKinsey Global Institute, March 2011.

139 Life expectancy from World Health Organization.

arrangements, either living alone or with roommates.[140] This shift may produce smaller and more dispersed families; the social fabric may not hold together in the same way without the deep extended ties that have characterized many of the region's communities in the past.

Urbanization could also spur improvements in education as it becomes easier to provide teachers in high-density locations and as families see the enhanced job opportunities that are available to graduates in cities. Today 32 percent of the adult population across the region has completed secondary school and only 11 percent have tertiary degrees, but these shares could rise to 43 percent and 16 percent, respectively, by 2030.[141] This trend would provide a greater pool of highly skilled labor that will shape the economy and attract new businesses to the region.

Urbanization carries risks, too, including the many social ills that take root in slums. In addition, Southeast Asia is particularly exposed to the threat of climate change and to the pressures of groundwater depletion, heightened demand for resources, and unsustainable management of fisheries.[142] The concentration of people in low-lying urban areas could intensify the impact of flooding from rising sea levels and intensifying storms. "Slash and burn" land-clearing practices carry air pollution to surrounding countries, blanketing cities with a haze that poses a recurring public health hazard.

## URBANIZATION COULD DOUBLE THE SIZE OF ASEAN'S CONSUMER BASE, DRIVING NEW PATTERNS OF DEMAND

As millions move to the cities of Southeast Asia for better job opportunities, the region is gaining a new wave of consumers with considerable spending power. Already some 81 million households in ASEAN states are part of the consuming class, with incomes exceeding the level at which they can begin to make significant discretionary purchases.[143] As the region continues to urbanize and a greater share of the population shifts from farming to manufacturing or service jobs with higher wages, that number could double to 163 million households by 2030 (Exhibit 30). Indonesia, in particular, will generate tens of millions of newly prosperous consumers.

The dramatic income shift caused by urbanization will spur demand for a wide range of goods and services. Not only will millions of households have discretionary income to spend for the first time, but millions more will move up into higher income segments, passing the point at which consumption accelerates sharply. A typical product adoption curve—or "S-curve"—begins flat (the "warm-up zone"), then climbs rapidly (the "hot zone"), and finally flattens out again (the "chill-out zone") as products penetrate a majority of households. This curve varies for different products based on underlying consumption patterns (Exhibit 31).

140 *Urban world: Cities and the rise of the consuming class*, McKinsey Global Institute, June 2012.

141 Educational attainment of population aged 15 and above from Barro-Lee data set.

142 *The economics of climate change in Southeast Asia: A regional review*, Asian Development Bank, April 2009.

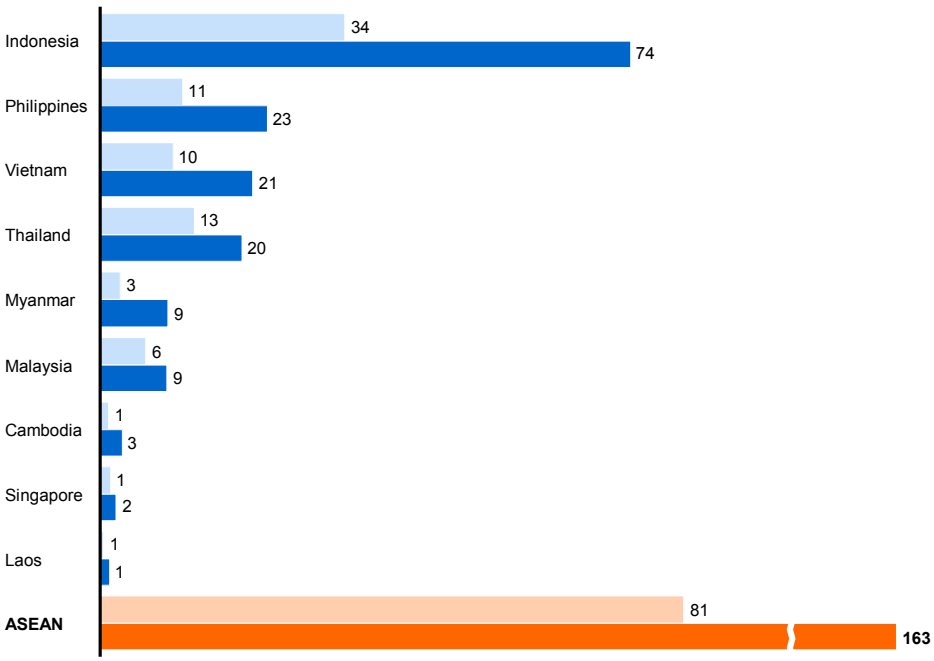
143 Defined as households with more than $7,500 in annual income (in 2005 purchasing power parity terms).

## Exhibit 30

### The number of ASEAN households in the consuming class is expected to double by 2030, with strong gains in Indonesia

Consuming class households, 2013–30[1]

Million



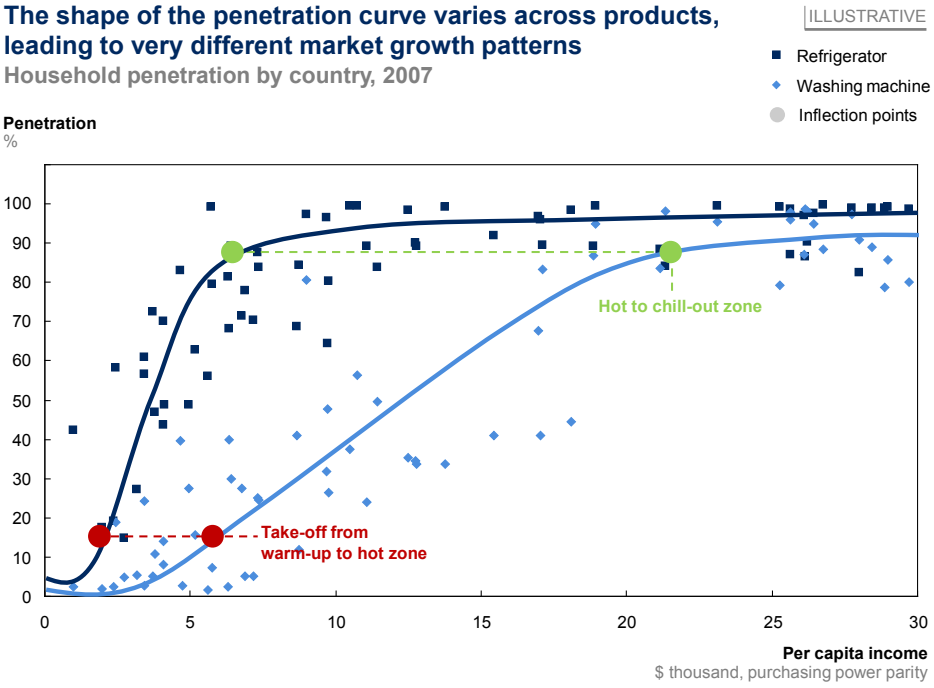

1 Defined as households with more than $7,500 in annual income (in 2005 purchasing power parity terms). This is the income level at which households begin to make significant discretionary purchases; Brunei not shown on chart as number of consuming class households in 2030 is only ~0.1 million.

SOURCE: McKinsey Global Institute Cityscope database; national statistics offices; McKinsey Global Institute analysis

## Exhibit 31

### The shape of the penetration curve varies across products, leading to very different market growth patterns

Household penetration by country, 2007




SOURCE: Euromonitor; McKinsey Global Institute analysis

By modeling a product category's sales growth trajectory relative to a country's GDP per capita, the inflection points demarking zone transitions can be established for different categories of goods. Looking at how product categories have taken off historically in countries around the world at various income levels, marketers can predict the probable sales trajectories for different categories in ASEAN countries. This allows companies to anticipate when sales will accelerate or plateau and adopt the appropriate strategies based on a category's position on the curve. Considering these types of trends, companies can begin to tailor market-entry strategies at the city level, picking the right categories to push at the right time. (For a discussion of additional types of considerations involved in entering new markets, see Box 7, "The challenges of consumer product launches in ASEAN").

In general, the most desirable market entry point is right before a category hits its hot zone. However, if a company enters the market earlier—taking a "planting the seeds" approach—it can secure a first-mover's advantage. Companies can also attempt to shift the curve by creating early demand through marketing and price promotions. Entering after the hot-zone phase is under way may cost more, but catching most of the acceleration can be lucrative, too. The S-curve can also alert marketers to when a product is approaching the chill-out zone, when it is too late to benefit from market expansion.

We worked with AC Nielsen to understand current city-level demand for a range of popular consumer goods in six ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam). We then worked with McKinsey's Global Growth Compass team to understand the potential evolution in this demand through 2030, based on the projected growth in city-level GDP per capita, and their knowledge of the relationship between demand and income in each category.[144]

The S-curve analysis can help marketers pinpoint opportunities at the city level. The future top 15 consumer markets for detergent, facial moisturizer, and instant noodles, for example, are a mix of cities across the region. While capital cities feature prominently, most of the others will be "middleweight" cities (Exhibit 32). As these cities transition to the hot zone, unexpected ones will become key markets by 2030. Cagayan de Oro in the Philippines, for example, could potentially be one of the top markets in consumption of diapers by 2030—today it ranks 35th among Southeast Asian cities. The geographical fragmentation of consumption growth will require businesses to rethink their footprint as well as their channel strategy.

144 See the technical appendix for further details on the methodology.

## Box 7. The challenges of consumer product launches in ASEAN

To enter ASEAN's consumer markets successfully, companies will need to deal with a fragmented wholesale and retail environment. New players will need to manage distributors effectively and take a city-level, rather than a national, view of markets.

Markets across ASEAN are highly diverse, both between countries and even within countries. As mentioned in Chapter 1, Singapore's GDP per capita is more than 30 times that of Laos and more than 50 times that of Cambodia or Myanmar; in fact, Singapore's per capita income even surpasses that of mature economies such as the United States and Canada. The standard deviation in average incomes between ASEAN countries is over seven times that of EU member states. The region is remarkably diverse in terms of culture, language, and religion. Myanmar alone has more than 135 ethnic groups.[1]

Although ASEAN is becoming more integrated, companies that want to gain a foothold in the region have to be aware of local preferences and cultural sensitivities; they cannot rely on a one-size-fits-all strategy. A successful product launch requires a deeper understanding of these markets and a set of microplans that target specific customer segments and regions. Big data analytics can unlock valuable insights about the nuances of consumer markets; see Chapter 4 for an in-depth discussion of this technology. In addition, companies need to adapt and build specific capabilities in the four areas discussed below.

**Product innovation for the ASEAN consumer.** To start with, companies need to develop well-crafted products that cater to the specific needs and habits of the ASEAN consumer. Developing effective R&D capabilities will require significant investment, but it can improve a company's ability to respond to changing trends quickly with offerings that are "sticky."

One example of product innovation in ASEAN is the development of Dutch Lady Complete dairy products. In 2012 FrieslandCampina conducted a large-scale study in ASEAN and found that a significant proportion of the region's consumers suffered from vitamin D deficiency. Building on this insight, the company developed a dairy drink with added vitamin D and launched it in Malaysia in 2013. Soon thereafter, FrieslandCampina opened a development center in Singapore to focus on dairy-based beverages and infant and toddler nutrition.[2]

**Optimizing the route to market will play a critical role.** The highly fragmented nature of ASEAN makes optimizing routes to market crucial to success. In Indonesia today, three-quarters of retail sales are through traditional channels. However, the share of spending through modern retail formats is rising rapidly.[3] The mini market convenience store format has caught on in recent years and now accounts for almost half of modern retail stores. Mini markets are popular with consumers because they stock a broader selection of merchandise and offer a more convenient shopping experience than traditional outlets. Further, mini markets may offer more competitive prices than traditional stores; in Jakarta, certain products are more affordable in Indomaret stores than in some traditional *warungs*.[4]

1 Oxford Burma Alliance.

2 FrieslandCampina website.

3 According to Market Management Indonesia (Asparindo) and the Indonesian Retail Merchants Association (Aprindo), traditional channels include wet markets (where live animals are sold), street stalls (*warungs*), and individually owned shops. Modern retail includes mini markets (e.g., Indomaret, Circle K), department stores (e.g., Matahari, Sogo), hypermarkets (e.g., Carrefour, Lotte Mart), supermarkets (e.g., Kem Chicks, Ranch Market), and specialty stores (e.g., Ace Hardware, Frank & Co.).

4 Based on a market visit conducted in September 2014, comparing prices of cooking oil, coffee, peanuts, and Coke.

## Box 7. The challenges of consumer product launches in ASEAN (continued)

McKinsey's Consumer and Shopper Insight survey suggests that the popularity of different channels varies by product category. For example, more than 80 percent of urban shoppers prefer to purchase home and personal-care products from modern retail stores, but more than half of consumers surveyed remain loyal to traditional markets, shops, and vendors for general food and beverages. In food retail, demand for chilled goods is providing impetus for the shift to modern formats; more than half of consumers prefer to buy categories such as ready-to-drink juice and chocolate at mini markets.[5]

The supply chain in many ASEAN countries generally consists of primary distributors, small wholesale companies, and the fragmented retail industry, which includes small shops and street vendors. Manufacturers often have a direct (but usually non-exclusive) contractual relationship with primary distributors and little control over the rest of the distribution chain. Generally, local players have an advantage because of their familiarity with local retailers. For this reason, companies entering the market usually partner with local distributors that have established networks. P&G Indonesia, for example, distributes its products through local distributors that have focused coverage in certain parts of the country.

**Selecting the right categories and price points is crucial.** Finding the right combination of price point and positioning for a given market is crucial. Filipinos, for example, have low disposable incomes combined with a preference for buying in small portions (*tingi-tingi*). According to Nestlé Philippines, 40 percent of its products are now sold in sachets that are available in more than 90 percent of shopping outlets. Lamoiyan Corp. and Colgate also sell sachet versions of toothpaste brands. Even in the finance sector, some life insurance companies are selling coverage at rates of one peso ($0.02) a day. BanKo, the microfinance arm of the Bank of the Philippine Islands, is now accepting deposits of as little as 50 pesos in its rapidly expanding branch network.

To reach a range of consumers, companies should develop a portfolio of products that caters to different income levels. This must be done carefully: products for lower-income consumers must be differentiated to avoid cannibalizing higher-priced products. Multinationals have to be especially careful not to dilute established global brand images by reducing prices. One potential solution is to develop customized brands for local markets with lower price points.

**Building strong brands will drive customer loyalty despite price consciousness.** Companies need to focus on cultivating brand loyalty among the region's consumers. Our consumer research has found that Indonesians are highly brand-loyal and prefer local brands, but only the perception of being local matters. And brand loyalty also varies between categories. For example, 82 percent of Indonesians stick to their preferred brand of facial moisturizer, but only 52 percent do likewise when it comes to biscuits.

Today television is the dominant medium for brand building in Indonesia, but Internet penetration has increased from 8 percent in 2008 to 16 percent in 2013. Although the Internet is becoming more widely used, we found surprisingly little evidence of consumers consulting websites to inform their purchase decisions in any category. In a McKinsey survey of 5,500 Indonesian consumers, the majority of respondents (37 to 65 percent) still depend on television advertisements in making shopping decisions, with only 1 to 4 percent of respondents saying that they receive product information through the Internet.[6]

5 *The archipelago economy: Unleashing Indonesia's potential*, McKinsey Global Institute, September 2012.

6 McKinsey Consumer Insights Indonesia, 2011.

Exhibit 32

**Smaller cities will rank among ASEAN's top 15 markets for certain consumer goods**

ASEAN cities by consumption

Large/megacities
Small/midsized cities

| 2030 rank | Detergent | 2013 rank | Facial moisturizer | 2013 rank | Baby diapers | 2013 rank |
|---|---|---|---|---|---|---|
| 1 | Manila | 1 | Bangkok | 2 | Ho Chi Minh City | 2 |
| 2 | Bangkok | 2 | Manila | 5 | Manila | 3 |
| 3 | Ho Chi Minh City | 4 | Singapore | 1 | Bandung | 9 |
| 4 | Cebu | 7 | Jakarta | 3 | Hanoi | 7 |
| 5 | Jakarta | 3 | Kuala Lumpur | 4 | Tangerang | 15 |
| 6 | Bien Hoa | 14 | Khon Kaen | 10 | Bekasi | 11 |
| 7 | Kuala Lumpur | 6 | Ho Chi Minh City | 6 | Jakarta | 1 |
| 8 | Singapore | 5 | Bien Hoa | 24 | Cebu | 19 |
| 9 | Hanoi | 10 | George Town | 7 | Bangkok | 4 |
| 10 | Davao | 9 | Bandung | 14 | Cagayan de Oro | 35 |
| 11 | Bandung | 19 | Chiang Mai | 13 | Bogor | 18 |
| 12 | Vung Tau | 12 | Nakhon Ratchasima | 11 | Kuala Lumpur | 5 |
| 13 | Cagayan de Oro | 22 | Johor Bahru | 9 | Singapore | 6 |
| 14 | Khon Kaen | 11 | Surabaya | 12 | Hai Phong | 16 |
| 15 | Chiang Mai | 15 | Chiang Rai | 19 | Malang | 40 |

SOURCE: AC Nielsen; national statistics offices; McKinsey Global Institute Cityscope database; McKinsey Global Growth Compass; McKinsey Global Institute analysis

In Indonesia, McKinsey has identified a number of smaller cities with significant promise for higher consumption as residents gain more disposable income and adopt more sophisticated spending habits. This research classifies 36 Indonesian cities into four tiers based on a consumption index that ranked cities on their population size, ability to spend, and propensity to consume.[145] Among the cities in the top tier of consumption are locations such as Denpasar, the gateway to Bali and a hub for other cities in the Lesser Sunda Islands. Tourism has fueled its growth, and new infrastructure projects are under way, including an airport expansion and new roadway construction. With a population of 900,000, it scores particularly high on ownership of durable goods and female literacy. With a population of one million, Gresik is an important trading city in East Java with a number of agriculture-related industries such as machinery, cement, and fertilizers. It also posts a very high ownership rate for durable goods. Other up-and-coming cities with strong demand growth include Padang, the capital of Western Sumatra; Bandar Lampung, the capital and economic hub of Lampung Province; and Madiun, a small city in East Java.

A closer look at one category can illustrate how demand evolves. Facial moisturizers typically enter the hot zone when incomes reach about $5,000 per capita.[146] Across different countries, the category carries a high hot-zone multiple of 1.34, meaning that for every 1 percentage point increase in GDP per

145 *The evolving Indonesian consumer*, McKinsey & Company Asia Consumer Insights Center, November 2013.

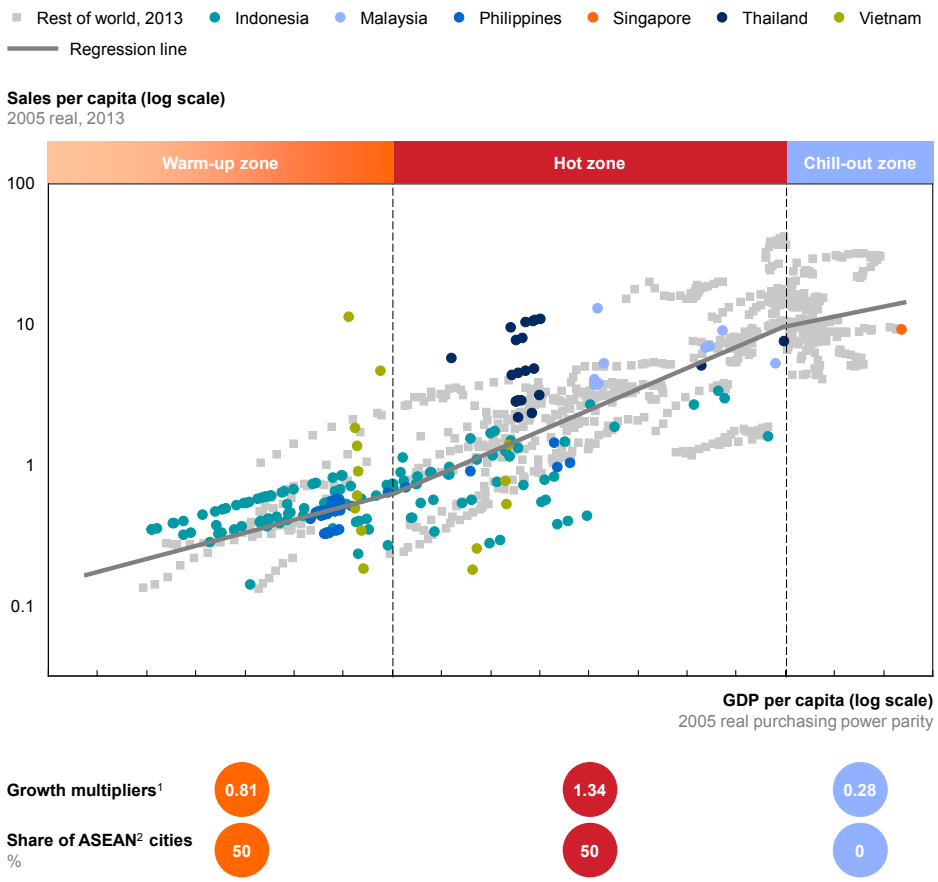
146 In 2005 real purchasing power parity terms.

capita, sales of facial moisturizers increase by 1.34 percentage points. In the five countries we examined, 50 percent of cities are in the warm-up zone for facial moisturizers, and 50 percent are in the hot zone (Exhibit 33).

**Exhibit 33**

**Half of ASEAN cities are in the warm-up zone for facial moisturizer and could move to the hot zone**

Category penetration relative to GDP per capita




1 Average % increase in category penetration from a 1% increase in GDP per capita.
2 2013 consumption and GDP per capita for cities in Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam with populations >200,000.

SOURCE: AC Nielsen; IHS; McKinsey Global Institute Cityscope database; McKinsey Global Growth Compass; McKinsey Global Institute analysis

## ASEAN NEEDS TO INVEST $7 TRILLION IN INFRASTRUCTURE AND HOUSING BY 2030 TO KEEP PACE WITH URBAN GROWTH

Growth in consumption is only one implication of urbanization. Cities also need to provide the underpinnings for sustainable economic growth and mobility—and the infrastructure in most ASEAN cities is already straining under the demands of expanding populations and new development. Recent MGI research shows that, with a few exceptions such as Japan, the value of infrastructure stock (excluding housing) in most economies averages around 70 percent of GDP.[147] But most of ASEAN falls well short of that level today (Exhibit 34).

This historical underinvestment is growing increasingly evident. Indonesia, for example, has about 27 kilometers of roads for every 100 square kilometers of land (compared with 72 kilometers in the United States and 185 in Germany), and

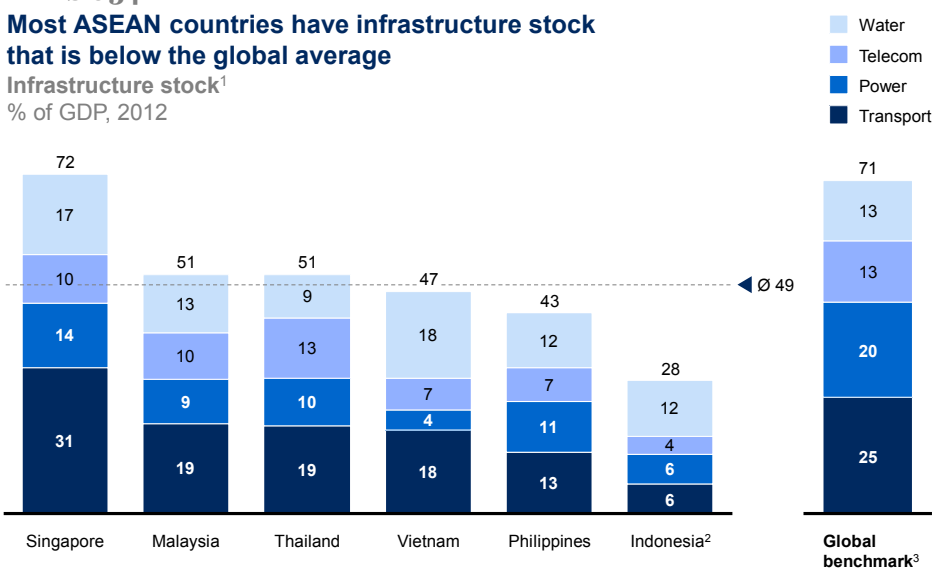
147 *Infrastructure productivity: How to save $1 trillion a year*, McKinsey Global Institute, January 2013.

only about 57 percent of the country's roads are paved. The practical implication of this is severe traffic congestion, which leads to more time spent traveling. Approximately a quarter of the population in Indonesia and the Philippines still lacks access to electricity (Exhibit 35).[148]

## Exhibit 34

### Most ASEAN countries have infrastructure stock that is below the global average

Infrastructure stock[1]
% of GDP, 2012

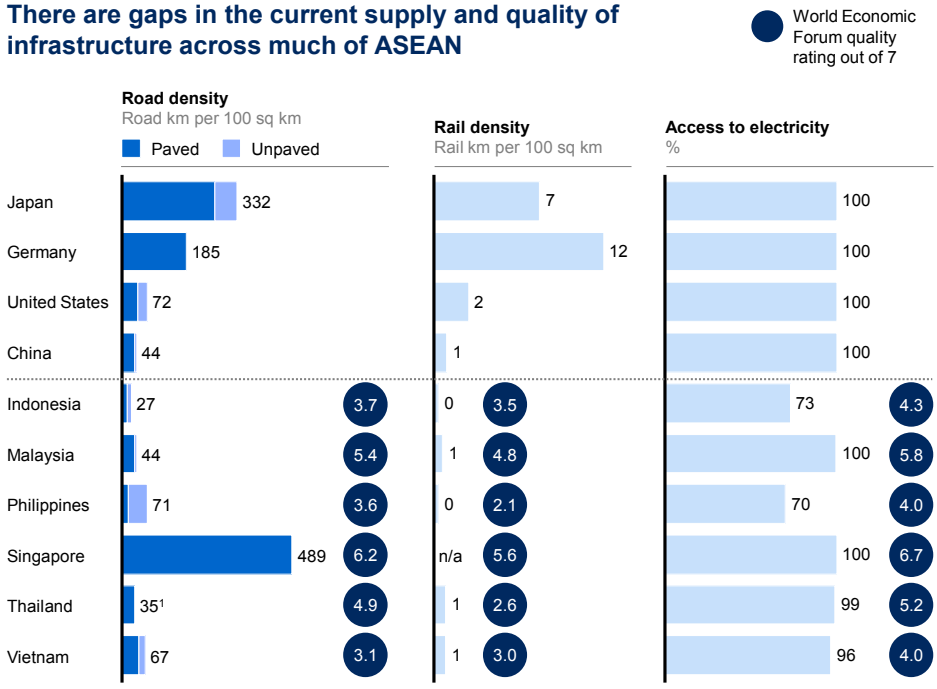



1 Estimated based on historical expenditure and using the perpetual inventory method.
2 Transport infrastructure stock for Indonesia is understated, as expenditure for rail, ports, and airports is not available.
3 Based on a study of Canada, China, Germany, India, Italy, Poland, South Africa, Spain, United Kingdom, and United States.

SOURCE: International Transport Forum; Global Water Intelligence; IHS; Perpetual inventory method, OECD, 1998; McKinsey Global Institute analysis

## Exhibit 35

### There are gaps in the current supply and quality of infrastructure across much of ASEAN




1 Split of paved and unpaved road is unavailable.

SOURCE: *World factbook,* US Central Intelligence Agency; World Development Indicators, World Bank; International Renewable Energy Agency; UN-Habitat; IHS; *Global competitiveness report 2013–14*, World Economic Forum; McKinsey Global Institute analysis

148 *World development indicators*, World Bank, 2014.

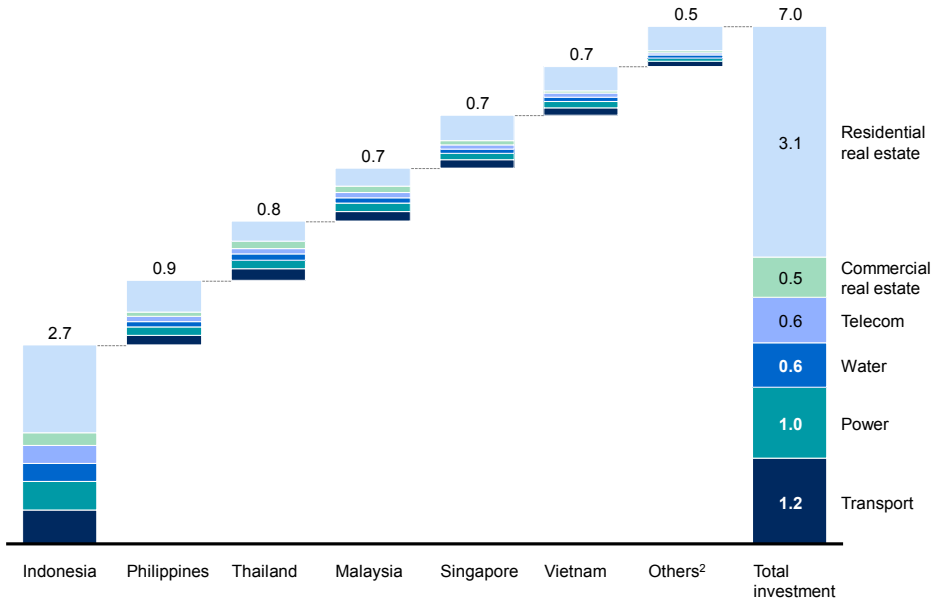
ASEAN states will need to sharply increase their historical investments in infrastructure in order to accommodate expected economic growth while maintaining the 70 percent benchmark ratio of infrastructure stock to GDP. Almost $3.4 trillion in investment not related to real estate will be required between now and 2030, most of which will need to be earmarked to support growing urban areas (Exhibit 36).[149] This is roughly two to six times the annual amount spent historically by ASEAN countries (Exhibit 37). If less developed economies are to meet their human development needs for widely accessible safe drinking water, basic sanitation, and power, the required investment will rise substantially.[150] Already countries recognize the need to build more infrastructure; the Philippines, for example, has set a target for future investment equivalent to 5 percent of GDP. The scale of these needs could set the stage for public-private partnerships, although these have yet to be firmly established across the region (see the discussion later in this chapter).

**Exhibit 36**

**ASEAN needs an estimated $7 trillion in infrastructure, housing, and real estate investment to support growth**

**Required infrastructure and real estate investment, 2014–30[1]**

$ trillion




1 In 2013 real dollar terms.
2 Includes Brunei, Cambodia, Laos, and Myanmar.
NOTE: Numbers may not sum due to rounding.
SOURCE: Pike Research; IHS; McKinsey Global Institute analysis

A simple increase in infrastructure spending will not be enough to guarantee that cities grow in a healthy and sustainable way, however. Infrastructure projects need to be part of holistic urban planning efforts that consider factors such as quality of life, public health, and sustainability, as we will discuss in greater detail in the sections that follow. If cities fail to take a long-term view in planning ahead for smart growth, they run the risk of creating an environment that eventually stifles economic growth.

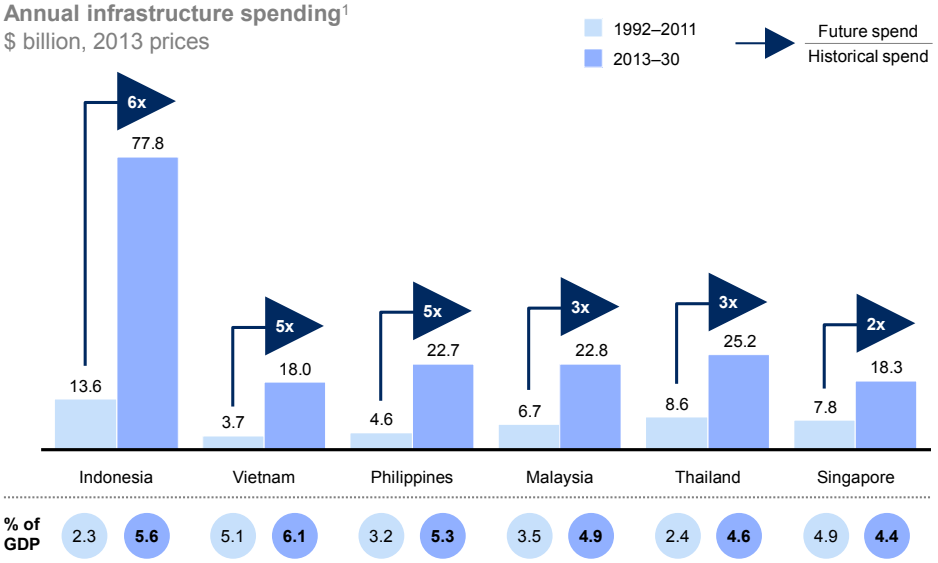
149 We benchmarked our infrastructure estimates against those by the Asian Development Bank in Biswa N. Bhattacharyay, *Estimating demand for infrastructure in energy, transport, telecommunications, water and sanitation in Asia and the Pacific: 2010–2020*, Asian Development Bank Institute working paper number 248, September 2010. The estimated need in both cases was 5.1 percent of GDP.

150 *Infrastructure, power and utilities + lifting-the-barriers roundtables*, McKinsey & Company and CIMB ASEAN Research Institute, 2014.

**Exhibit 37**

**ASEAN countries need to increase investment substantially to maintain their infrastructure stock at ~70 percent of GDP as their economies grow**

Annual infrastructure spending[1]
$ billion, 2013 prices




1 Includes total spending on transportation, power, water, and telecommunications infrastructure. Excludes real estate investment.

SOURCE: International Transport Forum; Global Water Intelligence; IHS; Perpetual inventory method, OECD, 1998; McKinsey Global Institute analysis

In addition to the growing stresses on infrastructure, there are large housing gaps across the region. More than 20 percent of the urban population in most ASEAN countries currently lives in substandard housing, and with more than 90 million people expected to move to cities through 2030, governments need to ensure that affordable housing is available on a sufficient scale to meet the needs of these new urban arrivals. Recent MGI research estimates that based on current trends in urban migration and income growth, roughly 440 million households around the world (or about 1.6 billion people) will occupy crowded, inadequate, and unsafe housing or will be financially stretched by their housing payments by 2025.[151] On top of building out the necessary water, power, sanitation, transportation, and communications infrastructure, ASEAN states will need to invest $3.1 trillion in residential real estate over the next two decades. Much of this housing investment is needed in the cities of Indonesia, where an estimated 5.9 million urban housing units are substandard, and an additional 50 million urban migrants are projected to arrive in the coming years (Exhibit 38).

Considering the region's infrastructure and real estate needs together brings the required investment over the next two decades to $7 trillion ($3.3 trillion in infrastructure, $3.1 trillion in housing, and $0.5 trillion in commercial space)—an amount that is roughly double the current GDP of Germany. However, this estimate does not take into account the starting point of infrastructure and real estate in terms of both supply and quality, which could increase and vary the investment requirements for all of ASEAN except Singapore. This poses a major funding challenge, particularly since private-sector investment in the region's infrastructure has never recovered from its decline following the 1997 Asian Financial Crisis.[152]

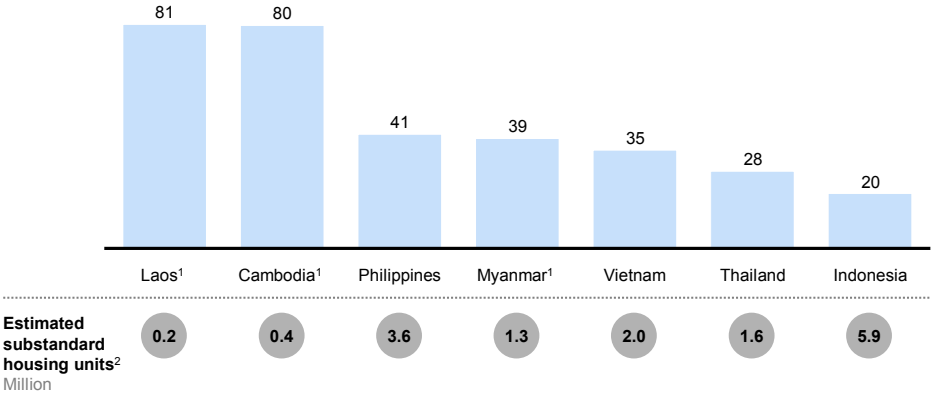
151 *A blueprint for addressing the global affordable housing challenge*, McKinsey Global Institute, October 2014.

152 Stephen P. Groff, "ASEAN's infrastructure crisis," *The Wall Street Journal*, July 28, 2014.

**Exhibit 38**

**In most ASEAN countries, a large share of the urban population lives in substandard housing**

2009, %




1 Latest available data for Cambodia, Laos, and Myanmar is from 2005.
2 Population living in substandard housing divided by national average household size.
NOTE: Data unavailable for Malaysia and Singapore (it is also widely recognized that there are no slums in Singapore).
SOURCE: United Nations World Population Policies database; United Nations Statistics Division; McKinsey Global Institute analysis

Undertaking these investments will be critical to determining whether cities develop in a livable and sustainable way or whether unplanned development leads to a host of urban ills—such as slum populations and chronic traffic jams. Beyond the importance of meeting the region's human development needs, infrastructure projects can generate jobs and yield a wide range of economic benefits, from greater global competitiveness to improved mobility and lower logistics and supply-chain costs.

### ASEAN can make infrastructure spending more productive by improving project selection and optimizing existing assets

With multiple infrastructure needs competing for scarce resources, governments cannot afford the delays and spiraling costs that accompany far too many large-scale projects. A relentless focus on making the most of every dollar invested could either reduce the capital that is required or deliver additional assets for the same amount spent.

Past MGI work has found opportunities to reduce the cost of infrastructure by around 40 percent. This approach is based on several principles: better project selection, more efficient delivery and greater accountability, an emphasis on maximizing the life span and capacity of existing assets, strong infrastructure governance, and a robust financing framework.[153] One example of improving project selection would be the government of Singapore. To support Singapore's broad socioeconomic goal of building a densely populated urban state, clear metrics were set: any project must contribute to the specific objective of achieving 70 percent use of public transit.[154]

153 *Infrastructure productivity: How to save $1 trillion a year*, McKinsey Global Institute, January 2013.

154 *Infrastructure, power and utilities + lifting-the-barriers roundtables*, McKinsey & Company and CIMB ASEAN Research Institute, 2014.

A deeper look at the performance of each country shows that Singapore is a standout, with particular strengths in project selection, maximizing existing infrastructure, and governance. In fact, the World Economic Forum ranks Singapore fifth in the world for the quality of its overall infrastructure.[155] (It is important to note, however, that Singapore is a compact, high-income country that does not face the same infrastructure challenges as ASEAN's more geographically sprawling and lower-income member states, which also have urgent competing priorities to support their economic development.) The government has developed a 50-year Concept Plan broken into clear sector-specific plans and prioritized projects that meet the country's most critical needs. It has also been able to make the most of its infrastructure through best practices in demand management. Besides implementing a road pricing and vehicle quota system, Singapore moved from a "ring" plan with a centralized business district to a "constellation" plan that clustered employment closer to residential areas, easing travel demand. Lastly, Singapore is known for a transparent, efficient government that is able to attract highly skilled talent.

Malaysia is also a regional leader in infrastructure. One of the key elements of the Tenth Malaysia Plan for economic development is building world-class infrastructure to support growth. The country actively solicits private-sector involvement, and in 2009, it established a dedicated public-private partnership (PPP) unit, the Unit Kerjasama Awam Swasta, in the prime minister's office. Private finance is playing a key role in the development of infrastructure, especially in transportation, telecommunications, and power.

Indonesia, the Philippines, and Thailand similarly struggle to maximize their existing infrastructure. Their major cities have shares of non-revenue water that are substantially higher than ratios in developed nations (51 percent in Jakarta, 13 to 53 percent in Manila, and 34 percent in Bangkok).[156] This group of countries has begun to develop effective frameworks, but they now need to ensure that changes are implemented in practice. The Philippines' Public-Private Partnership Center could be a step forward in advancing the country's funding framework. PPPs are a priority for the Aquino administration, and a clear and transparent process has been developed. Seven contracts have been awarded as of August 2014, and 47 projects are in the pipeline. However, most of these are smaller projects that have been awarded to domestic companies; the next step will be to attract foreign participation in larger projects, such as a planned subway and commuter railway.[157] In Indonesia, the Master Plan for the Acceleration and Expansion of Indonesia's Economic Development (MP3EI) designated six economic development corridors, but difficulties in land acquisition and lack of coordination among ministries and agencies slowed the progress. One of the projects, construction of the Sei Mangkei special economic zone, is on hold. A land acquisition law passed at the end of 2011 is expected to ease difficulties, but it will take time to implement supporting government regulation.[158]

155 *Global competitiveness report 2014–2015*, World Economic Forum, September 2014.

156 Ibid.

157 Miguel Camus, "PPP program: Of 54 deals, 7 awarded, 20 more at P900B," *Business Inquirer*, July 24, 2014.

158 Fidel Ali, "Indonesia infrastructure logjam blamed on land issues," *The Jakarta Globe*, April 3, 2014.

Myanmar and Vietnam have made progress but still lag behind the other ASEAN countries. Myanmar, in particular, has only recently begun to liberalize its economy, and its development policies are still a work in progress. A planning commission chaired by the president was established in 2012, and a national comprehensive development plan is being formulated. Vietnam is more advanced but struggles with its governance (the country ranks 116th in Transparency International's Corruption Perceptions Index) and planning. Despite this, the country has been able to make real progress in building infrastructure. It has successfully deployed significant official development assistance to build some 200 key projects over the past 25 years.[159]

Interestingly, many of the experts we interviewed felt that the key barrier to successful infrastructure management in the region was in project selection. Most countries have infrastructure plans that are somewhat linked to a national vision, but coordination across asset classes and clear guidelines on prioritization and evaluation may be lacking. The projects that are launched may not address the most pressing needs or deliver the desired benefits. Delivery can also be a constraint; efforts to increase transparency and reduce corruption sometimes lead to overly bureaucratic and cumbersome processes. Most countries across the region tend to default to investing in new construction rather than considering less costly alternatives such as better land use, demand management, or refurbishing existing infrastructure. Local officials would typically opt to address traffic by widening an arterial road into a city, for example, rather than enhancing public transit or implementing congestion pricing.

Taking an analytical approach to project selection is important to ensure that the investments being made will drive the greatest benefit to the community in terms of both productivity gains and social outcomes. When poor project selection occurs, infrastructure investment can become a drag on the economy that lowers productivity and crowds out other, more efficient projects.[160] Given the starting points across much of Southeast Asia, there is an opportunity to "get it right the first time." Governments will have to think long term and integrate infrastructure and overall land use into their planning processes, while conducting rigorous cost-benefit analysis in project selection.

## ASEAN CAN DEFINE A NEW APPROACH TO BUILDING GREAT CITIES

The growth of cities across ASEAN is generating economic momentum—but it also poses enormous challenges. Although incomes and prosperity are rising, many of the region's cities are struggling with quality-of-life issues. The Asia Competitiveness Institute's livability index analyzes 64 cities worldwide, and Singapore places third globally in the 2012 rankings, making it by far the best-performing city in the region. Kuala Lumpur (32nd), Bangkok (41st), and Hanoi and Ho Chi Minh City (tied for 52nd) fall further down the rankings (Exhibit 39). Although they are among the best large urban environments in ASEAN, they lag behind many major capitals in other parts of the world in terms of social progress and environmental indicators. Some of the region's largest cities are feeling the

159 2013 Corruption Perceptions index, Transparency International, December 2013; see also *ODA infrastructure projects in Vietnam, 1991–2013*, Vietnam ODA office, Ministry of Planning and Investment.

160 "Public Infrastructure," *Productivity Commission inquiry report,* volume 1, number 71, Australian Government Productivity Commission, May 2014.

strains of rapid population growth, which has led to traffic congestion, pollution, slums, and other urban issues.

**Exhibit 39**
**Large cities in ASEAN lag behind in a global ranking of livability**

Global Liveable Cities index, 2012[1] — 1–16, 17–32, 33–48, 48–64

| | Overall | Economic vibrancy and competitive-ness | Environmental friendliness and sustainability | Domestic security and stability | Socio-cultural conditions | Political governance |
|---|---|---|---|---|---|---|
| Singapore | 3 | 5 | 14 | 1 | 5 | 3 |
| Kuala Lumpur | 32 | 23 | 27 | 39 | 34 | 37 |
| Bangkok | 41 | 42 | 32 | 61 | 39 | 55 |
| Ho Chi Minh City | 52 | 51 | 40 | 37 | 55 | 61 |
| Hanoi | 52 | 51 | 40 | 37 | 55 | 61 |
| Phnom Penh | 61 | 44 | 53 | 51 | 63 | 58 |
| Manila | 63 | 61 | 44 | 64 | 60 | 54 |
| Jakarta | 64 | 54 | 64 | 49 | 64 | 56 |

1 The Global Liveable Cities index covers 64 global cities including megacities (with population exceeding 10 million), major cities in most developed economies, and major cities in major emerging economies. Inclusion is also based on data availability for the relevant indicators. "Overall" refers to global rankings among the 64 cities. No cities from Brunei, Laos, or Myanmar are included in the index.

SOURCE: Asia Competitiveness Institute; McKinsey Global Institute analysis

Addressing the infrastructure gaps outlined earlier in this chapter is only one aspect of planning, building, and managing vibrant cities that can simultaneously deliver economic growth and a high quality of life. Through analysis, case studies, and interviews, McKinsey's Cities Special Initiative has sought to learn which strategies are most effective for making urban areas better places to live and work.[161] It has outlined a "good to great" urban management framework built on three principles: achieving smart growth, doing more with less, and winning support for change. While there are many useful international case studies addressing these issues, the most useful insights for ASEAN are likely to come from within the region itself. We have therefore paired this framework with some of ASEAN's own success stories to illustrate how mayors and other local leaders are putting these principles to work and forging their own approaches to urban management. Dealing with these issues in a comprehensive way sooner rather than later will determine the economic benefit that these cities can reap from better jobs and greater consumption. Smart planning can also affect the extent of infrastructure spending that is necessary and ease some of the difficulties involved in building major systems after dense growth has already outstripped existing capacity.

## Achieving smart growth

All local leaders want to promote economic growth, but unless they begin with an overarching and cohesive plan, the results could be ineffective and scattershot. Successful urban planning and economic development have to start with a sound assessment of the city's competitive advantages, clearly defined goals, a well-crafted strategy to meet those goals, and targeted public investment to build the necessary foundations.

161 *How to make a city great*, McKinsey Cities Special Initiative, September 2013.

This could involve identifying a burgeoning industry cluster and then offering incentives to attract additional companies in that industry, building the infrastructure they require, connecting local businesses with investors, and cultivating skills by establishing a research institution. But other types of assets can form the basis of a successful economic development plan. In the case of George Town, the capital of Penang, a local non-governmental organization realized that the city's most valuable competitive advantages were its colonial architecture and multicultural heritage—assets that had not been fully developed and showcased. After the Penang Heritage Trust successfully campaigned to have the city designated as a UNESCO World Heritage Site, Penang's chief minister established George Town World Heritage Inc. to involve the public and to develop resources and expertise for conservation. George Town has built on this recognition to create a unique tourism proposition, and in 2010, it launched the George Town Festival, a sophisticated arts event that has drawn global notice and hundreds of thousands of attendees.[162] The city attracts six million domestic and international visitors each year, which has spillover effects for the rest of the island, including the local food industry.[163] In 2012, it also ranked as the eighth most livable city in Asia, ahead of Kuala Lumpur.[164]

George Town's strategy could be relevant to other cities in the region—mostly notably Yangon, which is at a critical juncture. Now that Myanmar has opened its borders, development is proceeding at a breakneck pace. But if Yangon can create a holistic plan that preserves its open green spaces and its colonial architecture in a more modern city incarnation, it could emerge as one of the most livable urban environments in Asia as well as a hub for tourism.

The world is replete with examples of cities that have expanded rapidly without any kind of planning in place. The result is chaotic at best, and at its worst, it impedes further development and harms citizens' quality of life and the environment. Rather than simply creating reactive policies, city leaders need a forward-looking vision that anticipates how populations will grow and considers the long-term impact on transportation, schools, hospitals, and many other aspects of city life. Those plans can be adapted over time to reflect the changing needs of the city and should adopt a regional perspective that includes surrounding municipalities.

Malaysia, for example, established the Iskandar Development Region as a special economic development zone that could attract investment in services and manufacturing by offering modern new facilities. The government is endeavoring to manage its growth by creating a comprehensive development plan that considers not only economic growth drivers but also socioeconomic equity and buy-in from the local population.[165] The plan defined five "flagship zones," each of which is anchored by key developments. Nusajaya, which is Zone B, for example, has been earmarked as the new Johor state administrative center, as well as a hub for education and medical tourism. Zone C, an inland port and cargo hub in the Port of Tanjung Pelepas, has been established as a center for logistics. As of

162 Chen May Yee, "Old colonial city in Malaysia becomes a stage: George Town Festival is making its name as a major arts event," *The New York Times*, July 31, 2014.

163 *Number of international and local tourist arrivals*, Penang State Government, 2012.

164 *Most livable Asian locations*, ECA International, April 2012.

165 *Investing in Iskandar*, Iskandar Regional Development Authority, October 2007.

the end of 2013, investors had committed almost $40 billion within Iskandar, of which more than half has already been invested.[166]

Iskandar's plan is noteworthy in that it took care to preserve South Johor's unique wetlands, which are rich in mangroves and intertidal mudflats. That approach is not always the norm: a global survey of municipal leaders and private-sector infrastructure providers finds that cities will typically prioritize economic growth over environmental concerns.[167] But the rapid growth of Southeast Asian cities has come at a significant environmental cost, which has real ramifications for the well-being of residents—and, ironically, for future economic prospects. To sustain growth in the long term, ASEAN's cities will have to focus on reducing air and water pollution and preserving green spaces.

Medan, Indonesia, for example, is actively trying to incorporate more environmental thinking into city planning. With support from the Asian Development Bank and the Institute for Transportation and Development Policy (ITDP), it launched a study of city transportation, congestion, and pollution aimed at finding new solutions. The results showed that while many of Medan's popular destinations are in close proximity to one another, they are not connected by adequate walkways, which leads to increased use of personal vehicles, *angkot* minibuses, or *bentor* rickshaws. ITDP Indonesia is working with local officials to draw up plans for reducing Medan's dependence on cars and investing in making the city more pedestrian-friendly.[168]

Perhaps the largest environmental concern for ASEAN is its vulnerability to the effects of climate change.[169] Its low-lying coastal cities—including Bangkok, Ho Chi Minh City, Jakarta, Manila, and Yangon—are frequently hit by tropical storms and catastrophic flooding that claim lives and cause displacement as homes and businesses are damaged.[170] The urban poor, who typically live in substandard housing, are at high risk. One study projected that some 115 million urban residents across Southeast Asia will be vulnerable to coastal flooding by 2025.[171] In addition to shifting to greener and more sustainable development that will reduce greenhouse gas emissions, cities will have to focus on building more resilient infrastructure. Iloilo, in the Philippines, for example, experiences flooding regularly and has been working with the Japan International Cooperation Agency to broaden its rivers and construct river floodways. Communities have been enlisted to help create hazard maps to mitigate potential risks.[172]

166 Lee Yen Nee, "Iskandar reaching critical mass as investments rise," *Today*, May 30, 2014.

167 *Megacity challenges: A stakeholder perspective*, Economist Intelligence Unit, GlobeScan, and MRC McLean Hazel, 2007.

168 *A look at life and transit in Medan, Indonesia*, Institute for Transportation and Development Policy, April 29, 2014.

169 *Climate change 2014: Impacts, adaptation and vulnerability*, Intergovernmental Panel on Climate Change, March 2014.

170 *Turn down the heat: Climate extremes, regional impacts, and the case for resilience*, World Bank, June 2013.

171 Guanghua Wan and Matthew Kahn, "Green urbanization in Asia," in *Key indicators for Asia and the Pacific 2012*, Asian Development Bank, 2012.

172 "Community-based adaptation and resilience against disasters: Self-assessment workshop on disaster risk reduction," Iloilo, JICA, and Yokohama, *CityNet*, volume 13, winter 2013.

Cities have generated unprecedented wealth and prosperity across Southeast Asia—but they also concentrate poverty and create extremes of income inequality. Urbanization offers the opportunity to deliver basic services more efficiently to a greater share of the population. Many cities across the region are making strides on this front, but others still have a formidable challenge ahead, as rapid population growth can overwhelm health-care systems and lead to overcrowded schools. Municipal leaders have to ensure that policies effectively reach the population segments that are most in need, which requires better-quality data and fundamental analysis to establish an accurate baseline.

Affordable housing is one of the most urgent needs for the urban poor, and Singapore's experience in meeting this challenge offers a useful template. Its Housing and Development Board was created in 1960 to address an acute shortage of decent housing. Its progress was swift: by the end of 1965, it was building some 12,000 flats per year. Within two decades, Singapore became the first Asian city free of slums and squatters.[173] More than 80 percent of the population today lives in government-subsidized housing designed to ensure access to affordable housing for all income levels, with multiple financing options and grants available to help citizens build wealth through home ownership.[174] The design of the Housing and Development Board's flats has been kept intentionally simple and utilitarian to keep costs low and speed construction. Projects have been carefully designed to blend into the surrounding skyline and preserve neighborhood green space, and common spaces and community centers were also built in to encourage neighbors to interact.[175] The government's housing policies incorporated strong regulatory powers for public-sector purchases of private land, concessions and tax incentives to encourage private-sector development, and a focus on cultural inclusiveness (by enforcing a balanced ethnic mix) and environmental management.

Singapore's approach to affordable housing builds on its master plan for land use, which sets out a long-term vision to manage competing priorities such as housing, defense, and industry. Its Concept Plan looks decades into the future to determine land use. In fact, Liu Thai Ker, former CEO of the Housing Development Board, has stated that planners even tried to think ahead by a century so that building at a low density in the short term would not eventually lead to Singapore's running out of land.[176] This perspective is incorporated into a Master Plan, which has a ten- to 15-year horizon and is more operational in nature. The plan is created through a combined effort of involving dozens of ministries and agencies and is reviewed at regular intervals to adapt to changing circumstances. By institutionalizing the twin principles of long-term planning and flexibility, Singapore has minimized disputes and disruptions while continuing to develop its limited land mass in a systematic way.

173 *Liveable and sustainable cities: A framework*, Centre for Liveable Cities and Civil Service College, June 2014.

174 *How to make a city great*, McKinsey Cities Special Initiative, September 2013.

175 *10 principles for liveable high-density cities: Lessons from Singapore*, Urban Land Institute and the Centre for Liveable Cities, January 2013.

176 *Liveable and sustainable cities: A framework*, Centre for Liveable Cities and Civil Service College, June 2014.

### Doing more with less

Cost-efficient operations are a hallmark of high-performing cities. This starts with an efficient tax agency that can secure all revenue due and carries through to city agencies that are held accountable for rigorously assessing and managing expenses. In recent years, ASEAN states have decentralized a greater degree of decision making, but for the most part, fiscal allocations remain under the control of central governments, constraining the investments that cities can make. This increases pressure on local governments to make the best use of limited funding and to find creative, cost-effective solutions to problems. City governments need to have the right analytical talent and processes in place to evaluate large capital investments in light of their impact on operational costs.

Jakarta's city government is currently experimenting with providing debit cards to almost 3,000 street vendors to streamline tax collection, encouraging them to use this method in exchange for city protection and the right to operate in a designated location. All vendors are required to have a minimum balance in their bank accounts from which payments will be automatically debited on a daily basis. If there is no automatic debit for three days in a row, vendors receive a warning; they are then sanctioned if payment is not made.[177] The use of bank cards makes revenue collection more efficient by reducing the need for field coordinators to collect daily payments; it also helps to eliminate the extortion and corruption that street vendors often face.

Technology provides governments with powerful tools for improving transparency and boosting the productivity and effectiveness of agencies. E-government initiatives can increase convenience and access to services, reduce the costs of procurement, and automate paper processes. Singapore, for example, has a strong track record of embracing technology solutions. Its OneMap online portal combines information with geospatial data, putting the results at the fingertips of public employees, businesses, organizations, and residents. Parents use it, for example, to make housing decisions based on locating within a particular elementary school district.[178]

PPPs are one option for bringing in private-sector expertise and capital. Many governments are hesitant to enter into these arrangements, as they are wary of ceding control over important public functions or infrastructure assets, and many private investors are themselves leery of whether PPPs can generate sufficient returns on investment to justify the risks. Cities that successfully execute such projects start by thinking through which public-sector activities belong in the public domain and which can be outsourced for efficiency, then creating and publishing a clear cost-benefit analysis and crafting agreements that establish transparent performance metrics and accountability measures. Since many cities across ASEAN lack experience with PPPs, local officials would need to engage the right technical and legal expertise to create well-designed agreements and legal frameworks to protect the public interest.

Manila Water is one of the region's most successful PPP examples. It has dramatically improved water and sewerage services for more than 11 million people in the metropolitan area. The PPP was launched in 1995 with passage of the Water Crisis Act, which privatized the Metropolitan Waterworks and Sewerage

177 "Jakarta to apply non-cash retribution to street vendors," *Tempo.co*, July 5, 2014.

178 *How to make a city great*, McKinsey Cities Special Initiative, September 2013.

System. At that time, almost two-thirds of the city's water was being lost to leaks, poor metering, and illegal connections; only 8 percent of homes had sewerage connections. Two private players, the Manila Water Company and Maynilad Water Services, won 25-year concessions for the east and west zones, respectively, and invested $7 billion to expand and improve water and sewerage services. The new operators were subject to full commercial and investment risks and were required to meet aggressive performance targets. An independent regulatory unit was established to monitor and enforce the concession agreement. As a result of the shift in operators, rates dropped by 74 percent in the east zone and 43 percent in the west. Only a quarter of households in the east zone had 24-hour access to water in 1997, but 99 percent had round-the-clock service by 2006.[179]

### Winning support for change

Transforming an urban environment requires more than smart planning. It also requires buy-in from citizens and an ongoing commitment to good governance and accountability from local officials. There are multiple ways to go about this, but one of the most effective is when a mayor articulates a vision that powers progress—and then leads by example. Across Southeast Asia, there are examples of individual city leaders who have made it a point to get out and engage with citizens on the street or to be seen biking to work to encourage citizens to minimize car traffic. Others may pick up the phone themselves to demand better performance from bureaucracies. Surabaya, Indonesia, for example, once known for pollution, has become cleaner and greener, with 22 percent of its land set aside as green space, due in part to the mayor's own passion for converting neglected spaces into parks and encouraging walking.[180] The city won the 2011 ASEAN Environmentally Sustainable Cities award (conferred by the ASEAN Cooperation on Environment) and was named the city with the best public participation in the Asia-Pacific region.

Southeast Asia continues to fight a legacy of corruption. Most of the region's countries score below 50 on Transparency International's Corruption Perceptions index, with the exception of Singapore, Brunei, and Malaysia (Malaysia scores 50). One former mayor of Da Nang, Vietnam, tackled this issue by implementing a clear recruitment process for city government, with specific job standards and descriptions where none existed before. He also established an internal public affairs department to address corruption issues.[181] Creating a new culture of accountability in government has created new economic momentum, with Da Nang rising to Vietnam's top ranking in the Provincial Competitiveness index, which measures the quality of the business environment.[182] The city has attracted an influx of new business, with 2013 foreign direct investment totaling $150 million.[183]

179 *Public-private partnership stories: Philippines—Manila Water*, International Finance Corporation, May 2010.

180 Indra Harsaputra, "Tri Rismaharini: Madame mayor iron fist, tender heart," *The Jakarta Post*, February 15, 2014.

181 Hai Chau, "Da Nang is one of the first provinces to establish Public Affairs Department," InfoNet, 2013.

182 The Provincial Competitiveness index is based on an annual survey conducted by the Vietnam Chamber of Commerce and the US Agency for International Development to gauge the perceptions of both domestic and foreign firms.

183 Foreign direct investment projects licensed in 2013, General Statistics Office of Vietnam.

Singapore has attracted more than 100 subsidiaries of foreign companies, thanks in part to its reputation for a highly capable and business-friendly bureaucracy.[184] The Singapore Public Service excels because the government recruits highly skilled talent, pays competitive salaries, invests in continuous training, and promotes individuals based solely on merit.[185] The Public Service Commission and other public agencies even award college scholarships to develop talent. And to ensure that their skills remain current, public employees undergo at least 100 hours of sponsored training per year.[186]

Phnom Penh's officials found themselves in need of widespread public support for the task of rebuilding the city's water system. During Cambodia's Khmer Rouge era, the country's water infrastructure fell into ruin and many of the skilled employees who ran it were lost. In 1993, when international sanctions were lifted, the water system was operating at just 45 percent capacity, with 72 percent of water wasted or siphoned off illegally.[187] The turnaround came when the authority's management was revamped to make it merit-based and create financial incentives for good performance. The authority also implemented a three-step increase in the water tariff, with tier rates to discourage waste. A government-sponsored public relations campaign focused attention on the importance of paying bills in order to rebuild the system; getting the public on board and changing behavior was crucial to success. Over the next 16 years, the system began to meet the quality standards set by the World Health Organization.

Where it once covered only 20 percent of the city's population and ran only ten hours per day, the system now covers 90 percent of the population and runs round the clock.[188] The water utility is now profitable, which gives it the ability to make further improvements to the system, and in 2012, it became the first domestically listed company on the Cambodian Securities Exchange.

Today local leaders can use new digital channels of communication to connect more effectively with their constituents on the issues that matter for their quality of life. Individual officials and government agencies alike can take to Twitter and other forms of social media to provide public updates and solicit input.

## TACKLING THE REGION'S URBAN PRIORITIES AND REALIZING THE OPPORTUNITIES

Cities across Southeast Asia will face many challenges in the years ahead, from planning for sustainable growth to addressing corruption. But cities also represent enormous opportunities for generating economic momentum and new business opportunities.

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184 Capital IQ database. See also Philip Yeo Liat Kok and Vernie Oliveiro, *Public service capacity-building for local-level development: The Singapore Public Service—a case study*, United Nations Economic and Social Council, Committee of Experts on Public Administration, January 2012.

185 Ibid.

186 N. C. Saxena, *Virtuous cycles: The Singapore Public Service and national development*, Civil Service College, Singapore Ministry of Foreign Affairs, and United Nations Development Program, March 2011.

187 Binayak Das, et al., *Sharing the reform process: Learning from the Phnom Penh Water Supply Authority*, International Union for Conservation of Nature and Natural Resources and Phnom Penh Water Supply Authority, 2010.

188 Ibid.

### Policy challenges

Sharing information and best practices can help policy makers find solutions to the common problems they face and could accelerate progress. Among the key priorities are the following:

- **Establishing affordable housing programs.** Given the current shortages of decent affordable housing, policy makers will need to put serious thought, energy, and funding into programs that can address this need as cities prepare for an enormous and ongoing wave of new urban migrants. A separate research initiative by the McKinsey Global Institute on affordable housing has identified four levers that can help to bridge the gap: unlocking additional land for affordable units at appropriate locations, taking an industrial approach to construction, increasing the efficiency of operations and maintenance, and developing inclusive finance opportunities.[189] Singapore's public housing is a successful model, but each country will have to develop a framework that suits its own context. With some $183 billion of annual investment required for housing across the region, this is a win-win opportunity for developers, investors, and financial institutions if governments are able to put in place the right enablers (such as land value capture, an effective delivery model, and seamless administration and permitting processes).

- **Building transparency.** The region is beginning to produce a new generation of inspiring local leaders, but corruption and poor governance remain stubborn and pervasive problems, as indicated by Corruption Perceptions index scores. Governments have to design systems that provide oversight and accountability without overly bureaucratic processes.

- **Developing resilience.** In 2009, the Asian Development Bank estimated that climate change could put as much as 6.7 percent of the region's annual GDP at risk by 2100, more than double the 2.6 percent impact on the world as a whole.[190] While most of the impact of climate change will be felt in the longer term, cities need to be able to withstand separate and shorter-term problems such as air pollution and natural catastrophes. Cities in Southeast Asia need to consider this when developing their long-term plans; building resilient infrastructure now can prevent hefty future losses.

- **Using technology to leapfrog.** Most countries in ASEAN are starting from a low base of technology usage—but that also means that they are not burdened with legacy infrastructure. Governments can take advantage of this clean slate to incorporate the latest technology tools for more productive infrastructure and city administration. They can also build digital connectivity into new development.

- **Building credibility to attract investors.** Managing and developing great cities requires substantial amounts of capital, and it will be difficult for governments to do it alone. Governments will have to attract viable private-sector and international partners to meet the funding challenge.

189 For more detail, refer to *A blueprint for addressing the global affordable housing challenge*, McKinsey Global Institute, October 2014.

190 *The economics of climate change in Southeast Asia: A regional review*, Asian Development Bank, 2009.

### Challenges and opportunities for businesses

The fast-growing cities of Southeast Asia are some of the world's most promising consumer markets that are still up for grabs. But the region's complexities demand that companies have the right strategies in place to capitalize on their potential.

- **Ride the S-curve.** Looking at how product categories have taken off historically in countries around the world at various income levels, marketers can predict the probable sales trajectories for different categories. This allows companies to anticipate when sales will accelerate or plateau and to adopt the appropriate strategies based on a category's position on the curve. Considering these types of trends, companies can tailor market-entry strategies at the city level, picking the right categories to push at the right time.

- **Tailor your approach.** Markets across Southeast Asia are highly diverse, between countries and even within countries. A successful product launch requires a set of microplans that target specific customer segments and regions, keeping local preferences and cultural sensitivities in mind. Big data analytics can unlock valuable insights about the nuances of consumer markets.

- **Tailor your products.** Companies need to develop well-crafted products that cater to the specific needs and habits of the Southeast Asian consumer. Local firms may need to make significant investments to developing R&D capabilities, but if they do so, they can better respond to changing trends quickly with offerings that are "sticky." Finding the right combination of price point and positioning for a given market is crucial.

- **Optimize the route to market.** The supply chain in many ASEAN countries generally consists of primary distributors, small wholesale companies, and the fragmented retail industry, which includes small shops and street vendors. Manufacturers often have a direct (but usually non-exclusive) contractual relationship with primary distributors and little control over the rest of the distribution chain. Companies entering new markets usually partner with local distributors that have established networks.

- **Broaden your offerings.** To reach a range of Southeast Asian consumers, companies should develop a portfolio of products that caters to different income levels. Multinationals have to be especially careful not to dilute established global brand images by reducing prices. One potential solution is to develop customized brands for local markets with lower price points.

□ □ □

Southeast Asia's current wave of urban growth is happening at unprecedented speed and scale. Understanding and preparing for this shift will be a critical component of successful business strategy in the decades ahead—especially as ASEAN becomes one of the world's key consumer markets. The region will also have to act quickly to build a solid foundation of infrastructure and housing to meet the continued demands of surging populations. If ASEAN's leaders can develop a more innovative and sustainable model of urban planning, the continued growth of cities could add some $520 billion to $930 billion to the region's annual GDP by 2030 while improving the quality of life for millions of households.

# 4. Disruptive technologies: Five catalysts for economic growth and social change

Southeast Asia is undergoing an urban and industrial transformation that is lifting millions out of poverty—and it is doing so against a backdrop of accelerating technological progress. Just how quickly can the emerging economies of the region develop in an age of disruptive breakthroughs?

Much of ASEAN (with the notable exception of Singapore) is starting from a relatively low base in terms of digital infrastructure, adoption, and innovation. The World Economic Forum's Networked Readiness Index finds that only Singapore, Malaysia, and Brunei currently rank among the world's top 50 countries for the quality of their digital environment and the extent of their technology usage.[191] While this highlights the challenges that lie ahead, it implies that the opportunity for technology-driven growth is larger for Southeast Asia than for more developed regions. It also points to the possibility of digital leapfrogging in multiple areas. Most countries across the region had low penetration of landline phones and fixed-line broadband Internet, for instance—but now they are bypassing these stages altogether to make the leap directly onto the mobile Internet. Rapid adoption of technology is setting the stage for new sources of growth to take off.

Five digital technologies, in particular, are poised to create substantial economic growth and societal change in Southeast Asia during the next decade: the mobile Internet, big data, the Internet of Things, the automation of knowledge work, and cloud technology. These innovations have applications across multiple sectors and the entire region.

These advances are all closely related and work in concert with one another. An intricate urban transit system, for instance, may rely on the Internet of Things to track the position of trains and subways in real time, spotting breakdowns or bottlenecks right away. But the mobile Internet needs to be present for this data to be transmitted. It can then be aggregated in the cloud, with big data analytics used to synthesize the information; automated systems and signs can post updates on the implications without the need for employee action. Health-care systems could particularly benefit from combining these technologies to bring together data from far-flung facilities and to store and analyze patient records. This could produce more efficient allocation of resources, better public health policies, faster responses to disease outbreaks, and substantial cost savings. These five innovations are mutually reinforcing; the penetration of one sets the stage for wider use of the others.

191 *The global information technology report 2014: Rewards and risks of big data*, World Economic Forum, 2014.

The impact of these five technologies is fundamentally dependent on the availability, quality, and affordability of underlying information and communications technology (ICT) services. While it is a positive development that millions of Internet users across the region have gained access to social media, for example, it is another thing entirely for businesses to be able to count on a stable, high-speed Internet connection (whether fixed or mobile) to take advantage of cloud technology. If the region can put the necessary backbone infrastructure in place, it has an opportunity to harness the power of technology for rapid productivity improvements.

Southeast Asia could also make real progress across the other dimensions we have outlined as being pivotal to economic development. Digital technologies can create more inclusive growth by extending the reach of formal banking services, education, and health care, and by lowering the barriers to entry for SMEs. They can make economies more diverse, increasing their resilience. They also make organizations of all types more agile by creating new platforms for innovation and new tools that can respond to changing market conditions. However, technology is likely to cause some disruption in the labor market. We estimate that 12 million to 17 million workers in non-farm jobs, or 6 to 8 percent of the non-farm labor force in 2030, could be displaced. Governments will have to ensure that affected workers have avenues for support and retraining.

Within many sectors, there is large value at stake for companies that move quickly to take advantage of these technologies and carve out competitive positions early. Together, these five digital innovations account for the bulk of the $220 billion to $625 billion in economic impact that could be achieved from deploying various disruptive technologies in ASEAN by 2030.

Over the coming decade, the region will have a chance to make rapid strides in modernizing sectors across the economy and in connecting citizens with information and public services. Capturing this potential is no small challenge, especially for Southeast Asia's lower-income countries. But if public- and private-sector leaders succeed in putting the right building blocks in place, disruptive technologies could be a dramatic accelerator of the region's growth and progress.

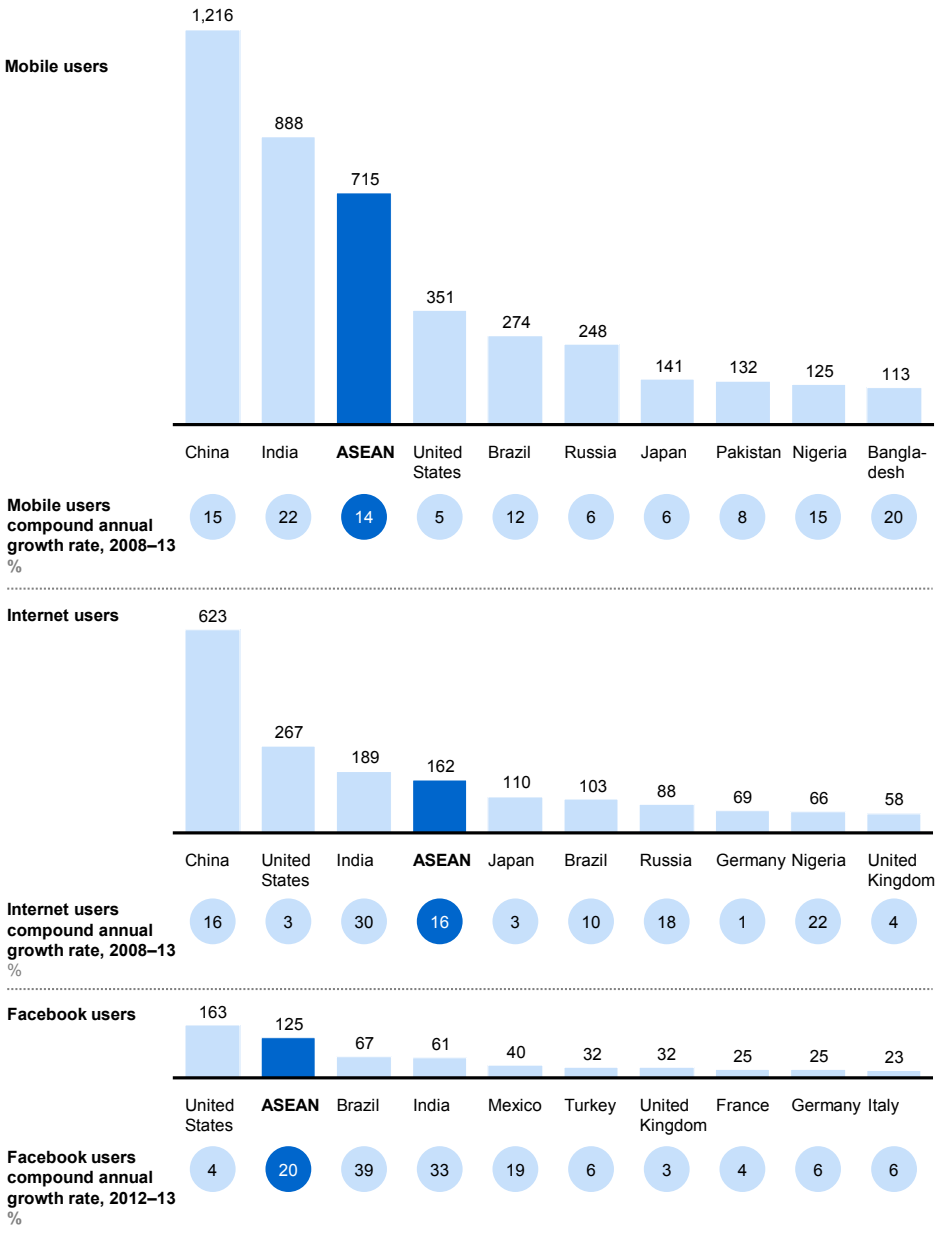
## ASEAN IS RAPIDLY GOING DIGITAL

ASEAN has already proven highly receptive to new technology. With penetration rates of approximately 110 percent, mobile phones have become ubiquitous: across the region, some 350 million mobile subscriptions were added from 2008 to 2013, placing ASEAN just behind India and China in the total number of mobile users. The number of Internet users also grew at a brisk 16 percent annually during the same period (Exhibit 40).

## Exhibit 40

### Technology adoption in ASEAN is increasing rapidly

Million users, 2013




SOURCE: World Bank; World Cellular Information Service; Socialbakers; McKinsey Global Institute analysis

Although adoption is growing rapidly, there are striking differences in digital readiness and capabilities by country (Exhibit 41). The World Economic Forum ranks hyper-connected Singapore second in the world for the quality of its digital environment, while Myanmar, which is just beginning to reconnect with the world, ranks 146th out of 148 countries.[192] The region's largest economies face multiple bottlenecks in their digital development, most notably in infrastructure and skills. Disruptive technologies can achieve significant impact only if these underlying issues are resolved and countries can deliver affordable, widespread access to high-quality Internet services.

**Exhibit 41**

## Only Singapore, Malaysia, and Brunei rank among the top 50 countries for technology "readiness"

**Selected indicators from the Networked Readiness Index 2014**[1]

**Ranking** 1–10 11–25 26–50 51+

| | | Readiness[2] | | Usage[3] | | | |
|---|---|---|---|---|---|---|---|
| Overall rank | Country | Infra-structure | Affordability | Skills | Individual | Business | Government |
| 2 | Singapore | 16 | 46 | 2 | 10 | 15 | 1 |
| 30 | Malaysia | 71 | 48 | 67 | 49 | 27 | 9 |
| 45 | Brunei | 37 | 129 | 30 | 50 | 56 | 30 |
| 64 | Indonesia | 85 | 37 | 61 | 95 | 36 | 49 |
| 67 | Thailand | 73 | 47 | 74 | 85 | 59 | 84 |
| 78 | Philippines | 89 | 75 | 69 | 91 | 43 | 67 |
| 84 | Vietnam | 121 | 8 | 88 | 84 | 88 | 58 |
| 108 | Cambodia | 97 | 105 | 119 | 105 | 78 | 114 |
| 109 | Laos | 125 | 130 | 118 | 129 | 74 | 89 |
| 146 | Myanmar | 136 | 146 | 115 | 143 | 145 | 143 |

1 The Networked Readiness Index includes four sub-indexes: Environment, Readiness, Usage, and Impact.
2 The Readiness sub-index measures the degree to which a society is prepared to make good use of an affordable ICT infrastructure and digital content.
3 The Usage sub-index assesses the individual efforts of the main social agents to increase their capacity to use ICT as well as their actual use in day-to-day activities.

SOURCE: *The global information technology report 2014*, World Economic Forum

192 Ibid.

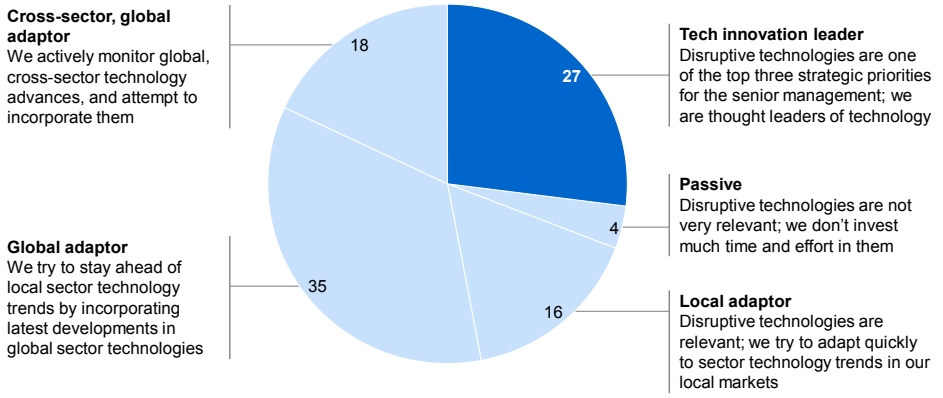
Similarly, there is wide variation in the degree to which firms across Southeast Asia incorporate technology into their operations today—and the degree to which they are focused on how new breakthroughs can drive future growth. A recent McKinsey survey of more than 1,200 executives across the globe found that companies with higher organic growth rates and operating margins were more likely to characterize their strategic posture as "out-innovating others" and to rate their own overall innovation performance more highly.[193] Another survey that specifically focused on executives in the ASEAN region found that only about a quarter of respondents listed disruptive technologies as a top management priority (Exhibit 42).[194]

**Exhibit 42**

**Our survey found that most businesses monitor technology trends, but only about a quarter make them a top strategic priority**

**On a scale of 1–5, how much attention is dedicated to applications of disruptive technologies today?**[1]

%




1 Survey of 49 business leaders across all ASEAN countries. Respondents included operations across all ASEAN countries and included small startups (10%), small and medium-sized enterprises (12%), and large enterprises with more than 200 employees (78%). Some of the industry sectors represented were financial services, education, manufacturing, agriculture, health care, government services, consumer, and retail.

SOURCE: McKinsey Global Institute analysis

Although incumbent industry leaders in more traditional sectors may be somewhat hesitant to adopt new technologies, new high-tech fields such as mobile payments, e-commerce, online gaming, and online advertising are taking off across Southeast Asia. Small but vibrant tech startup scenes are taking root as the entire region is beginning to build a greater capacity for innovation (see Box 8, "Innovation in ASEAN").

193 Other options for strategic posture included "Keep pace with our top two or three competitors," "Be a fast adopter or follower," "Keep pace with the industry average," and "No particular posture." Options for self-assessment of overall innovation performance include "Low," "Medium," and "High." Results for ASEAN respondents were in line with overall global results, even though sample size of n = 29 is low. McKinsey Quarterly Innovation Portfolio Management Survey, 2013.

194 The survey polled 49 business leaders across all ASEAN countries. Respondents included operations across all ASEAN countries. It should be noted that results could be biased toward reflecting the views of larger firms, which made up 78 percent of our sample vs. small and medium-sized enterprises (12 percent) and small startups (10 percent). Some of the industry sectors represented were financial services, education, manufacturing, agriculture, health care, government services, consumer, and retail.

### Box 8. Innovation in ASEAN

ASEAN countries may not have produced a high-tech hub with a global reputation as of yet, but they are beginning to build a startup culture and a small but growing wave of digital innovation with its own regional twist. A small sampling of the innovative activity taking place in the region hints at the potential that could be unleashed.

**Blk 71** is a government initiative to bring the heart of Singapore's startup scene under one roof. This one-stop shop and incubation space for newly launched creative and tech companies was established in 2011 in the Ayer Rajah Industrial Estate. Today it houses more than 100 startups, including Zimplistic (a chapati maker) and Flocations (an online travel portal), and incubators such as NUS Enterprise and Joyful Frog Digital Incubator. Blk 71 is also host to Plug-In@Blk 71, which provides a common platform for business ventures to connect; it aims to accelerate the growth of fledgling ventures with business clinics, networking sessions, venture capital pitching sessions, and industry sharing seminars. Building on the success of Blk 71, Singapore's minister of state for trade and industry has announced that the government is setting aside more space in Ayer Rajah to nurture startups, including the conversion of Block 73 and Block 79, which can be expected to hold more than 200 startups and is estimated to be ready by the end of 2014.

In Thailand, **True Incube** is a seed fund and incubator program launched by the True Corporation (a telecom company) in 2013. It aims to connect local entrepreneurs to a network of more than 200 mentors in 500 startups, as well as provide global expertise on building businesses. The program hosts five to ten startups in a co-working space for 99 days at a time, exposing participants to various dimensions of setting up a business, such as fundraising, customer acquisition, and distribution. The seed fund invests 500,000 baht (about $15,600) in each startup that is accepted into the program in return for at least a 5 percent equity stake. Follow-on investments of up to 5 million baht (about $156,000) are also made available if True Incube sees real potential. One of the new ventures launched by the program is Taamkru, which uses games delivered by Web and mobile apps to prepare preschoolers for exams, while allowing parents to track and compare their child's performance.[1]

One of Indonesia's leading online forums and e-commerce sites, **Kaskus**, was founded by three local students whose school project evolved into a business opportunity. Starting off as a site the students used to translate news into Bahasa Indonesia, Kaskus developed into a bulletin board forum for communities—and then achieved huge growth in online ad sales as its traffic grew.[2] It is now one of Indonesia's leading e-commerce platforms, where more than 6.8 million registered users can buy and sell items. Today, Kaskus receives over 750 million page views and 25 million unique visitors every month.[3] Another example of Indonesian innovation and the region's growing pool of specialized talent can be found in Central Java; a local engineer from Salatiga emerged as the winner of a global competition held by GE to redesign an aircraft bracket. His submission, which beat out 700 other entries, successfully slashed the bracket's weight by more than 80 percent while maintaining its integrity and mechanical properties.[4]

1 Terence Lee, "Taamkru plans to fix Thailand's 'disgracefully bad' education system, raises seed money," *Tech in Asia*, July 30, 2014.

2 Willis Wee, "The story and future of Kaskus," *Tech in Asia*, April 20, 2012.

3 Enricko Lukman, "Indonesia's Kaskus makes first changes under new CEO, now has 750 million monthly page views," *Tech in Asia*, May 21, 2014.

4 "Jet engine bracket from Indonesia wins 3D printing challenge," GE Reports, December 11, 2013.

## FIVE DISRUPTIVE TECHNOLOGIES STAND OUT WITH THE GREATEST POTENTIAL TO TRANSFORM MULTIPLE SECTORS OF ASEAN'S ECONOMY BY 2030

Recent MGI research identified 12 disruptive technologies that will transform the way business is conducted and the way individuals live and work on a global scale.[195] This report focuses on a subset of these new advances with the greatest relevance to Southeast Asia's unique context and its social and business challenges.

Chief among these considerations is the "archipelago" nature of much of the region, which creates considerable barriers of geography. Indonesia, for example, has 17,508 islands, of which close to 6,000 are inhabited.[196] Technologies that can help to overcome physical distance and gaps in the logistics network could thus be particularly valuable to the region. The mobile Internet, for instance, could go a long way in bringing banking, education, and health-care services to remote populations.

Due in part to its geography and to the challenges of integrating ten separate and diverse nations, ASEAN has complex, multilayered distribution networks, with complicated routes to markets and low-capability middlemen slowing the flow of goods. Consider the grocery store segment: putting aside Brunei and Singapore, more than half of all grocery markets in the region are traditional mom-and-pop retailers. In Cambodia, Laos, and Vietnam, this figure exceeds 90 percent. This leads to significant fragmentation in supply chains.[197] Technologies that can help to manage or streamline such complexities would have great relevance for ASEAN. Radio frequency identification (RFID) and other advanced sensor/actuator technologies related to the Internet of Things can track goods in transit and help companies manage supply chains, reducing operational costs while improving service. While RFID technology has existed for decades, falling costs have significantly increased its adoption. As of 2012, most standard tags cost $0.05 to $0.12, with experts expecting the figure to fall below $0.05 within five to ten years.[198] E-commerce is gaining a foothold in the region as the number of users on the mobile Internet increases, supporting the growth of online marketplaces such as Lazada and Rakuten. With the right infrastructure, regulatory, and competitive environment, the shift toward e-commerce should shorten long supply chains and delivery delays.

Another issue that is ripe for technology solutions is the region's shortage of crucial skills. A study by the International Labour Organisation and the Asian Development Bank reports that more than half of all high-skill employment in Cambodia, Indonesia, Laos, the Philippines, Thailand, and Vietnam could be filled by workers with insufficient qualifications.[199] Technologies that expand access to education and vocational training will therefore have a high impact in the region. Digital learning tools, including Web-based lessons and distance learning, can improve access to education in rural areas where there are not enough teachers.

195 *Disruptive technologies: Advances that will transform life, business and the global economy*, McKinsey Global Institute, May 2013.

196 *The world factbook*, US Central Intelligence Agency.

197 Euromonitor, 2013.

198 Deborah L Weinswig et al., *Weinswig's deep dive: Retail technology*, Citigroup Global Markets research, January 13, 2012.

199 *ASEAN Community 2015: Managing integration for better jobs and shared prosperity*, International Labour Organisation and Asian Development Bank, August 2014.

Health-care workers are also in short supply in rural areas, and technologies such as telemedicine and remote patient monitoring can extend the impact of doctors. For example, portable ultrasound devices that can be operated by trained midwives (rather than radiologists) have helped increase access to prenatal care in Indonesia. By contrast, labor-saving technologies such as advanced robotics could have less relevance in most ASEAN countries, depending on the extent of wage increases, as labor costs are still generally low. The cost of an innovation such as advanced industrial robotics for manufacturing would need to fall faster than labor costs are rising to spur investment in this area. Indeed, manufacturers in the region have yet to take full advantage of simple automation of monotonous and repetitive tasks, much less advanced robotics with greater mobility, dexterity, flexibility, adaptability, and the ability to learn from and interact with humans.

Because of the region's rapid growth in consumption, businesses increasingly need tools that can help them understand and serve new segments of demand. As discussed earlier in this report, some 81 million households in ASEAN states are already part of the consuming class, with incomes exceeding the level at which they can begin to make significant discretionary purchases. That number could double to 163 million households by 2030. As the middle class grows in both number and affluence, consumer-facing companies in a variety of industries need to understand more about the preferences of this group—and to meet its rising expectations for better-quality products and services. Big data analytics can deliver more sophisticated customer insights to allow companies to tailor their offerings to meet microsegments of the marketplace.

Given Southeast Asia's unique context, some of the 12 technologies identified in MGI's global research will be interesting for particular sectors but less relevant for the region as a whole. For example, advanced oil and gas exploration and recovery has received a lot of attention but is unlikely to take flight in the region over the next 15 years on a scale that would create a truly disruptive impact (see Box 9, "Advanced oil and gas exploration and recovery in ASEAN").[200] Similarly, autonomous vehicles could have interesting applications in the mining sector, reducing the need for drivers and their associated costs and safety risks.[201] Yet the relatively low labor costs in the region may not justify wide-scale adoption of autonomous trucking systems.

200 Other technologies on the global list that we deemed to be less relevant for ASEAN include autonomous and near-autonomous vehicles, next-generation genomics, advanced robotics, advanced materials, renewable energies, and advanced energy storage.

201 Mining giant Rio Tinto, for example, has started to test partly autonomous trucks in its Australian mining operations; the trucks follow predefined routes and load and unload material without an operator. See *Disruptive technologies: Advances that will transform life, business, and the global economy*, McKinsey Global Institute, May 2013.

## Box 9. Advanced oil and gas exploration and recovery in ASEAN

This chapter's primary focus is on disruptive technologies that can have broad impact across multiple sectors and countries in ASEAN. However, we also examined some advances that could produce a large impact within very specific sectors or locations. One of these is unconventional oil and gas exploration and development. Most of the region's unconventional reserves are believed to belong to Indonesia, which has an estimated 46 trillion cubic feet and 7.9 billion barrels of risked, technically recoverable shale gas and shale oil resources, respectively, on top of 159,000 million Btus of coal-bed methane production estimated in 2014.[1]

The development of unconventional reserves in the United States has prompted discussion of whether ASEAN could also experience a similar "shale revolution." But while the US shale boom may appear to have happened overnight, it actually took 35 years to move from discovery to production, which suggests that the development of shale gas and oil is subject to a lengthy learning curve. Indonesia (and ASEAN more broadly) is at the very start of the process. Developing its reservoirs will require much more seismic data gathering and exploration.

There are also a host of other issues to overcome. There is currently no regulatory framework to govern unconventional exploration and drilling in Indonesia. For example, under existing regulations on conventional oil and gas, two operators can be awarded permits to extract different types of resources from the same block, as the resources are viewed as two separate assets. Furthermore, government fuel subsidies discourage investment in unconventional energy development. Lastly, the technologies and techniques that worked in the United States may not necessarily translate to other parts of the globe; shale geology is different in every country, and Indonesia would also need the requisite skills.

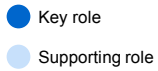
Given these considerations, it is unlikely that unconventional oil and gas will have a disruptive impact in the region by 2030. Our conservative estimates suggest that this impact could be approximately $4 billion in 2030. To accelerate or expand these gains, the region's policy makers—and particularly the Indonesian government—would have to make shale and coal-bed methane development a major priority. This could involve reducing the complexity and uncertainty of current permit procedures as well as supporting efforts to explore and map reservoirs. More broadly, it will also require taking steps to mitigate any negative environmental impact (such as contamination of groundwater) and actively engaging with citizens to help address their concerns.

1 *Technically recoverable shale oil and shale gas resources: An assessment of 137 shale formations in 41 countries outside the United States*, US Energy Information Administration, June 10, 2013; "Brazil will become the top oil producer nation in Latin America," Rystad Energy press release, August 6, 2014.

Bearing these nuances in mind, we have zeroed in on five related digital innovations that could be particularly important in multiple sectors across ASEAN by 2030: the mobile Internet, big data, the Internet of Things, the automation of knowledge work, and cloud technology (Exhibit 43).

**Exhibit 43**

**Certain disruptive technologies stand out for their relevance in ASEAN**




| Technologies | Sectors | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Resources[1] | Infrastructure | Agriculture and food | Consumer and retail | Manufacturing | Financial services | Health care | Education | Government services |
| Mobile Internet | | | ● | ● | | ● | ● | ● | ● |
| Big data[2] | ○ | ● | ● | ● | ● | ● | ● | ● | ● |
| Internet of Things | ○ | ● | ● | ● | ● | | ● | ○ | |
| Automation of knowledge work | | | | | | ● | ● | ● | ● |
| Cloud technology | | ○ | ○ | ○ | ○ | ● | ● | ● | ● |
| 3D printing | ○ | | | ○ | ○ | | ○ | | |
| Advanced materials | | ○ | | | ○ | | ○ | | |
| Autonomous and near-autonomous vehicles | | ○ | | | | | | | |
| Next-gen genomics | | | ○ | | | | ○ | | |
| Advanced oil and gas | ○ | | | | | | | | |
| Renewable energy | ○ | | ○ | | | | | | |
| Advanced energy storage | ○ | ○ | ○ | | | | | | |
| Advanced robotics | | | | | | | ○ | | |

1 Includes mining and oil and gas.
2 Given the importance of big data and advanced analytics for the region, we have included it here even though it is not considered as a separate technology in *Disruptive technologies: Advances that will transform life, business, and the global economy*, McKinsey Global Institute, May 2013.
SOURCE: McKinsey Global Institute analysis

## The mobile Internet

With wireless Internet networks expanding across the region and the cost of smart devices continuing to fall, some Southeast Asian countries have moved directly onto the mobile Internet as their preferred means of going online. A McKinsey survey of consumer behavior in Asia, for instance, found that 71 percent of respondents in Indonesia normally access the Internet on their phones or tablets vs. 39 percent who do so at home on their PCs or notebooks.[202] Similarly, a large share of Internet users in Myanmar access the Web only on their phones, skipping the use of PCs entirely.[203] Urban residents in most countries can access a growing number of free wi-fi hot spots, although

202 McKinsey iConsumer Asia research conducted in 2012 across multiple countries including Malaysia, Indonesia, the Philippines, and Vietnam, with 3,000 to 6,000 respondents per country, targeting Internet users ages 15–64.

203 Steven Milward, "Myanmar's new mobile internet users embrace Android smartphones, pick Viber over Facebook," *Tech in Asia*, June 24, 2014.

coverage and speeds are inconsistent. As a "mobile-first" market, Southeast Asia may take a very different path of Internet evolution than more developed regions have experienced. Already the region is producing an explosive proliferation of apps.

The mobile Internet has applications for large and small businesses and the public sector alike, creating opportunities to increase workforce productivity and extend the delivery of many services to underserved locations. It is a particularly useful vehicle for overcoming geographical barriers and allowing rural populations to access products and services that were beyond their reach until recently.

Mobile banking and mobile payments are expanding financial inclusion. SMART money and GCASH, for example, offer Filipinos banking services such as international remittances on their mobile devices. The latter has also been used by the Department of Social Welfare and Development and the Land Bank (a government financial institution focused on rural development) to deliver social welfare benefits to recipients instead of hiring helicopters to physically deliver cash.[204] The mobile Internet is also putting more products within reach of consumers outside of the largest cities, where brick-and-mortar retail remains underdeveloped. Combating difficulties posed by supply-chain fragmentation, e-commerce marketplaces are springing up, such as Lazada, which draws 250,000 visitors per day to its Indonesian site.[205] Similarly, telemedicine can expand access to health care in remote areas, and online coursework delivered on tablets or smartphones can improve the quality of education and teacher training across the region.

The rapid rise in mobile penetration rates in Cambodia, Laos, and Vietnam hints at the potential for the mobile Internet to take flight. However, in Myanmar and other countries where population density is lower, it is harder to expand network coverage due to the high capital expenditures required to establish an adequate number of base stations for mobile coverage (which are incurred on top of high operating costs related to power and maintenance).[206] To bring the mobile Internet to remote populations, governments will need to play a critical role in offering a supportive and predictable regulatory landscape that can attract investment in network infrastructure.

### Big data

Big data refers to data sets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze.[207] Indeed, advances associated with the mobile Internet, the Internet of Things, and the cloud have led to an explosion in the collection of data around the world.

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204 Chris Bold, *GCASH supports the Philippine government's programs*, Consultative Group to Assist the Poor, March 29, 2011.

205 Jacky Yap, *Here's Lazada's scoresheet on conquering Southeast Asian e-commerce*, e27, June 20, 2013.

206 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

207 This incorporates a moving definition of how big a data set needs to be in order to be considered big data—a number that varies by sector, depending on what software tools and sizes of data sets are common in an industry, and over time as technology advances. See *Big data: The next frontier for innovation, competition, and productivity*, McKinsey Global Institute, June 2011.

The ability to analyze this deluge of information and act on it in close to real time could be a game changer as Southeast Asia's newly prosperous middle class begins to flex its purchasing power. To better cater to consumers, companies will need to understand increasingly granular microsegments of their markets. In the consumer and retail sector, this knowledge can influence many aspects of the consumer decision journey, from advertising formats to loyalty programs. A classic example is Amazon's next-product-to-buy analysis, which employs collaborative filtering to generate "you might also want" prompts for each product bought or visited.[208]

Not only does big data apply to every consumer-facing sector, but it also offers major new capabilities to financial institutions (which can use big data analytics for more sophisticated risk management) and the public sector (which can greatly improve functions ranging from tax collection and procurement to disaster response). Sharing electronic medical records and analyzing patient data could lead to much more effective administration of health-care services.

Companies across the region have thus far been slower to adopt big data than their global peers. In a survey conducted with C-level executives in early 2013, only 13 percent of respondents in Asia claimed their businesses had a well-defined data management strategy, compared with 21 percent in Europe and 23 percent in the United States.[209] Much of ASEAN is at a low starting point regarding data collection, much less usage. While this underscores the substantial amount of effort and commitment required for big data and advanced analytics to have a real economic impact, it also highlights the large upside potential.

### The Internet of Things

The Internet of Things refers to networks of sensors and actuators embedded in machines and other physical objects that connect with one another and the Internet. It has a wide range of applications, including data collection, monitoring, decision making, and process optimization (and it is closely related to big data analytics, since the vast stream of information collected from these systems needs to be synthesized and acted upon).

RFID tags on containers and boxes, for example, can track products as they move through warehouses and transportation hubs to store shelves and all the way to the consumer. Companies in the consumer goods, retail, and even agriculture sectors will stand to benefit from the ability to tighten their supply chain in real time to avoid stock-outs, excess inventory, and losses. GPS-enabled telematics can also enable real-time management of fleets and distribution networks—a particularly important capability across ASEAN, where highly fragmented supply chains imply that any hitch could lead to losses as a long lead time is required for the good to reach its intended user. FedEx enables customers to track the progress of packages almost continuously by placing a small device (about the size of a mobile phone) into packages. These devices contain both a Global Positioning System and sensors to monitor temperature, humidity, barometric pressure, and light exposure, which are critical to cargo such as

208 Ibid.

209 Total sample size of 317. See *The hype and the hope: The road to big data adoption in Asia-Pacific*, Economist Intelligence Unit, November 2013, citing *The data directive: How data is driving corporate strategy, and what still lies ahead*, Economist Intelligence Unit, commissioned by WiPro, April 2013.

biological samples and sensitive electronic equipment. Such continuous data availability has significant implications for companies that operate the region's long and complex supply chains.[210] Similarly, smart storage and tracking systems in the agricultural supply chain can reduce the incidence of food spoilage and waste by monitoring temperatures of containers along the supply chain.

The Internet of Things can also support Southeast Asia's rapid urbanization by providing tighter management of complex infrastructure. Thailand's water authority has started to implement a state-of-the-art system to monitor and consolidate data across all of its regional water systems to track supply, losses, customer use, and water levels during flooding. It relies on the Internet of Things to capture real-time data and uses sophisticated big data analytics in a command center to synthesize the information and respond to changing conditions.[211]

### Automation of knowledge work

Advances in artificial intelligence, machine learning, and natural user interfaces (such as voice recognition) are making it possible to automate many tasks that had long been regarded as impossible or impractical for machines to perform. This breakthrough could have significant benefits for ASEAN given its localized shortages of skilled labor (for example, less than 10 percent of the working population in Cambodia, Laos, and Myanmar has attained secondary schooling).[212] The automation of knowledge work can go a long way toward filling in gaps or empowering workers with less training to achieve greater impact.

In the longer term, it can help build up a new generation of skilled labor by widening access to education through digital learning, even in places where there are too few educators.

An example from the education sector illustrates the point. It takes education, skill, creativity, and judgment for teachers to evaluate students and modify their curricula and teaching techniques based on student performance, but there are simply too few well-trained teachers to serve students in many parts of the region. However, education systems can extend their reach and provide support to overstretched teachers by employing algorithms that evaluate student performance and suggest specific points for greater classroom focus. For example, the Khan Academy, a global non-profit educational organization, uses algorithms to adapt tests based on the student's mastery of course content; right answers allow for progression onto more advanced topics, while incorrect answers yield simpler questions. It also recommends next steps, depending on each individual's progress.[213]

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210 *Disruptive technologies: Advances that will transform life, business, and the global economy*, McKinsey Global Institute, May 2013.

211 Kelly Ng, "Thailand's water authority to join up all data across three provinces," FutureGov, July 23, 2014. See also "AGT International helps Hydro & Agro Informatics Institute of Thailand develop advanced flood management system," AGT International press release, August 29, 2012.

212 World Bank Education Statistics (Barro-Lee data set); working population here refers to the population above 25 years of age.

213 Saomya Saxena, "Khan Academy's new learning dashboard," *EdTech Review*, March 22, 2014.

### Cloud technology

The cloud enables network access to a shared pool of computing resources such as servers, storage, and applications that can be used as needed. It can be implemented as a third-party service or by companies that pool their computing resources on their own private clouds. The cloud already creates tremendous value for consumers and businesses by making the digital world simpler, faster, more powerful, and more efficient. It provides the data storage space and computing power needed to enable apps and many other technologies, including those described earlier in this chapter.

Singapore is creating the "H-Cloud," which will host all mission-critical systems for public hospitals, specialty centers, and polyclinics that are part of its Integrated Health Information Systems, consolidating all their data onto one central private cloud.[214] Aside from cutting costs by providing data storage through one central resource, this pooling of information could pave the way for more efficient and effective patient treatment.

As costs come down, the widespread adoption of cloud computing will give companies across the region pay-as-you-go access to secure storage and infrastructure services, basic software, and enterprise systems. Many SMEs have limited access to IT services today, but cloud technology can allow businesses to reap the efficiencies of new technologies without tying up capital in IT systems that could quickly become obsolete. Advances in cloud computing will also reduce the costs associated with the storage and analysis of big data on the cloud, without incurring the costs associated with transitions from legacy systems.

## DISRUPTIVE TECHNOLOGIES COULD CONTRIBUTE $220 BILLION TO $625 BILLION TO THE REGION ANNUALLY BY 2030

Together, the five disruptive technologies discussed above, along with several other sector-specific disruptive technologies (5D building information modeling technology in infrastructure, advanced genomics in agriculture and health care, and 3D printing in the consumer and retail sector) have the potential to unleash some $220 billion to $625 billion in annual economic impact by 2030 (see Box 10, "Sizing the sector-level impact of disruptive technologies in ASEAN"). The effects of the five digital technologies explored in this chapter will be broadly felt across many sectors (Exhibit 44). For companies, they represent market opportunities as well as avenues for lowering costs and making their operations more productive. More broadly, they can generate enormous consumer surplus and enable governments to deliver public services more efficiently. Together they can produce a leapfrog effect in modernizing how business is conducted across the region.

214 Kelly Ng, "Private cloud to cut costs for Singapore's public health," FutureGov, August 21, 2014.

## Box 10. Sizing the sector-level impact of disruptive technologies in ASEAN

Our estimate of the potential economic impact of disruptive technologies includes the five main applications identified as being particularly relevant for ASEAN (the mobile Internet, big data, the Internet of Things, the automation of knowledge work, and the cloud), plus additional technologies that are likely to generate significant value within a particular sector, bearing in mind the region's stage of development. These include other technologies beyond the mobile Internet that also support mobile banking (for example, SMS banking systems), 5D building information modeling (BIM) technology in optimizing infrastructure project delivery, advanced genomics in agriculture and health care, as well as 3D printing in the consumer and retail sector.

Our overall estimated total impact spans the entire regional economy, but it is built on a sector view. Our first step was identifying applications associated with these technologies that could have impact within specific industries. We then worked with McKinsey and external industry experts to understand how these applications could reshape each sector, while also taking relevant international benchmarks into account. Finally, we estimated potential productivity gains, revenue upside, or consumer surplus that could be achieved in each sector by 2030 across all of the relevant applications.

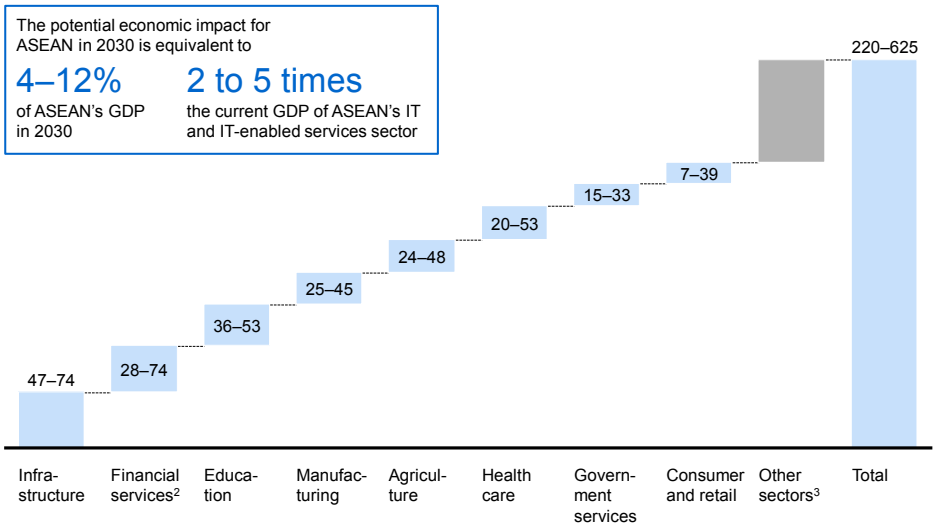
These bottom-up sector estimates complement our top-down approach to estimating the overall impact of disruptive technologies in the region. For more details on this top-down approach, see the technical appendix.

Exhibit 44

### Disruptive technologies have significant potential across key sectors in ASEAN economies

**Potential annual economic impact in ASEAN[1]**

$ billion, 2030




**Notes on sizing**

- Estimates of economic impact are not comprehensive and include potential direct impact of sized applications only.
- These estimates are not achievable through technology alone. They assume that complementary enablers, such as training, incentives, and infrastructure, are put in place to capture the full potential value.
- Relative sizes of impact shown here cannot be considered a "ranking" because sizing is not comprehensive.
- We do not quantify the split or transfer of surplus among or across companies or consumers. Such transfers would depend on future competitive dynamics and business models.
- Estimates are not directly additive due to partially overlapping applications and/or value drivers.
- The estimates are not fully risk- or probability-adjusted.

1 These estimates do not represent GDP or market size (revenue), but rather economic potential, including consumer surplus. See the technical appendix for further explanation.
2 Includes $17 billion–$52 billion of sector-related impact from sector-related effects such as greater financial inclusion.
3 Additional sectors represent 25–30 percent of ASEAN's total GDP. Impact estimate based on top-down estimate of disruptive technologies.

SOURCE: McKinsey Global Institute analysis

## TECHNOLOGY BREAKTHROUGHS COULD RESHAPE KEY SECTORS OF THE REGION'S ECONOMY

Technology will be a powerful catalyst for GDP growth and productivity gains at the macroeconomic level. But its truly disruptive impact is best understood by examining how these changes could play out within sectors. The following section examines how individual companies and organizations might deploy these technologies to revamp their operating models, tap into new markets, and grow revenue, as well as how consumers could benefit from such innovation.

It is also worth noting that these technologies will not solely benefit ASEAN's more advanced economies. Technology can play an important role in addressing skills shortages in less-developed countries by extending the impact of highly trained workers and providing support systems and tools to help workers without full training do more. In the longer term, they can build a new generation of skilled labor by widening access to education through digital learning, even in places where there are too few educators. The region's less-developed countries have already displayed an enormous appetite for new technology: mobile penetration rates in Vietnam, Laos, and Cambodia went from less than 5 percent to over 70 percent in less than a decade.[215] This hints at the potential for technology to be a disruptive force in the near future even in less developed markets, provided they can put the requisite digital infrastructure in place.

### Banking: Accessing new markets and serving existing customers more efficiently

In the banking sector, financial institutions are beginning to use technology to reinvent customer service and delivery models. The shift to digital channels and automation not only lowers the transaction costs associated with serving existing customers by moving them online, but also changes the economics of serving millions who are currently "unbanked." Improved data collection and analysis can give financial institutions better risk-management capabilities, allowing them to reduce non-performing loans even as they increase lending to underserved SMEs.

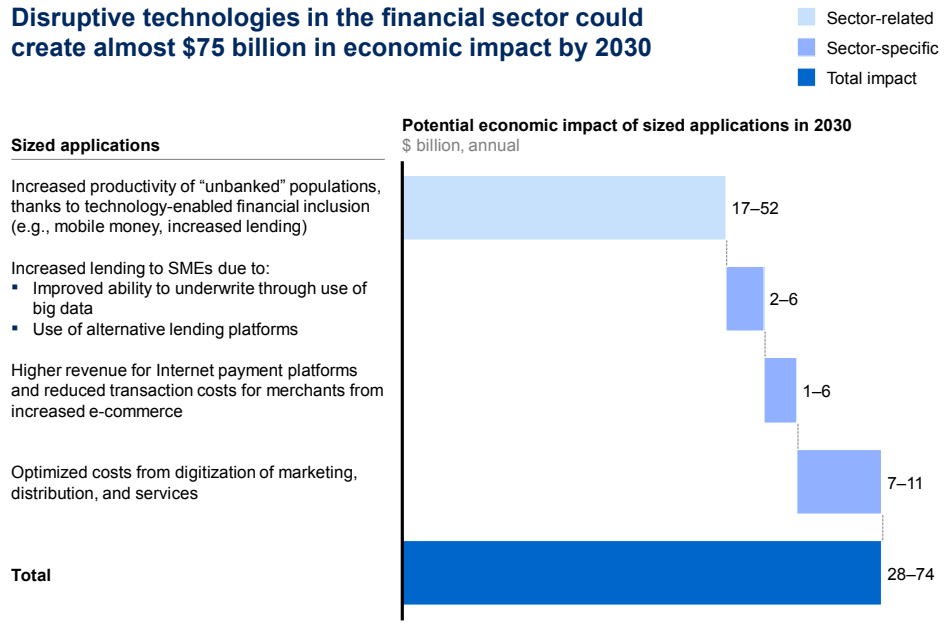
We estimate that adoption of disruptive technologies could generate $11 billion to $22 billion in annual economic impact in the banking sector by 2030. This represents 5 to 10 percent of the sector's projected GDP by that date (Exhibit 45).[216] In addition, the economy will see a gain of $17 billion to $52 billion, as access to formal banking services enables individuals who were once excluded from the financial system to be more productive.

215 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

216 This refers to the financial sector, excluding insurance and pensions but including players such as payment platforms. GDP projections are from IHS Global Insight World Industry Service.

**Exhibit 45**

**Disruptive technologies in the financial sector could create almost $75 billion in economic impact by 2030**




NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute analysis

- **Financial inclusion.** As of 2011, only an estimated 30 percent of the adult population across ASEAN member states had access to traditional banking services, implying that more than 270 million people were excluded from the financial system.[217] The gap between the region's high savings rate and the low number of bank accounts suggests that many individuals turn to less reliable informal financial services, which extend credit at punishingly high interest rates.[218]

  Mobile money can be crucial for overcoming the tyranny of geography in Southeast Asia, where traditional financial institutions have found it difficult to build out their footprint in remote areas and across many islands. It has already proven to be a huge accelerator of financial inclusion in other parts of the world. In Kenya, M-Pesa, a service of mobile phone carrier Safaricom, is perhaps the world's most celebrated example of mobile innovations bringing banking services to millions who were previously excluded from the formal financial system.[219] Being able to send money via their mobile phones allowed many Kenyans to transfer money even without a bank account, providing them a cheaper, safer, and more convenient alternative for making payments or sending remittances. Today M-Pesa is used by some 17 million customers around the world, and in Kenya, Safaricom has introduced a complementary

217 Measured as percentage of population above the age of 15 who had an account at a formal financial institution in 2011. Based on ASEAN, excluding Brunei, Laos, and Myanmar, where data were not available. Global Findex (Global Financial Inclusion database), last updated in 2012.

218 *Doubling financial inclusion in the ASEAN region by 2020: Outcome report of the Consultation with Southern Market Leaders in Financial Services for the Poor*, CARD Mutually Reinforcing Institutions, UN Capital Development Fund, 2014.

219 William Jack and Tavneet Suri, *Mobile money: The economics of M-Pesa*, NBER working paper number 16721, January 2011; and Ignacio Mas and Dan Radcliffe, "Mobile payments go viral: M-Pesa in Kenya," in *Yes Africa can: Stories from a dynamic continent*, P. Chuhan-Pole and M. Angwafo, eds., World Bank, August 2010.

mobile savings platform called M-Shwari.[220] Similar models exist in the ASEAN region. WING, for example, is a mobile payment service provider that was launched in Cambodia in 2009. It has provided financial services to more than 90,000 customers, most of whom were not using any other banking service.[221] As smartphone penetration increases, the mobile Internet will have a bigger role to play in supporting such mobile money programs. GCASH in the Philippines, for example, has developed a mobile app for smartphones to enhance its existing mobile money services.[222]

Big data and advanced analytics techniques can also play a role in expanding access to credit. Today, non-traditional data can be used to assess creditworthiness, enabling financial institutions and even non-bank players to lend to individuals who do not own homes, use credit cards, or have verifiable income that banks typically use to conduct risk assessment. For instance, Oi Telecom in Brazil scored credit for 2.7 million prepaid mobile customers in one of the poorest regions of Brazil. In another case, a bank in Central America teamed up with a supermarket chain to identify "marker products" associated with high- and low-risk customers, based on transaction data such as items bought, quantities, price, time of purchase, location, and mode of payment, for more than one million customers. This helps the bank to augment credit-risk scoring and qualify customers for starter loan products.[223]

All told, greater financial inclusion fueled by new technologies could lead to $17 billion to $52 billion of annual economic impact across the region by 2030. This assumes that these technologies could extend the reach of formal financial services to roughly half of the unbanked adult population (more than 160 million people) in countries where financial access is relatively low.[224] This can in turn enable individuals to benefit from a 5 to 15 percent improvement in productivity and income, which is a conservative estimate compared with what has been witnessed in nations such as Kenya (which experienced a 5 to 30 percent improvement).

- **Increased lending to SMEs.** Banks in the region have long been reluctant to lend to SMEs, since assessing their credit risk was too difficult and costly. But the use of big data and advanced analytics can change that, even when small businesses have relatively limited credit histories. China's CITIC Bank, for example, is using big data from Union Pay, an association for the country's banking card industry, to provide loans to merchants based on their point-of-sale transaction data.[225] The larger number and variety of real-time data points allows for better selection of borrowers, and early identification of troubled borrowers allows for intervention.

220 "Vodafone M-Pesa comes to Europe for the first time," Vodafone press release, March 31, 2014.

221 Brad Jones, *WING's contribution to "Making money fair" in Cambodia*, WING Social Impact Report, 2009.

222 "GCASH mobile app (for iOS, Android, and BlackBerry)," Globe, www.globe.com.ph/gcash/gcash-mobile-app.

223 *India's technology opportunity: Transforming work, empowering people*, McKinsey Global Institute, September 2014.

224 This includes Cambodia, Indonesia, Laos, Myanmar, the Philippines, and Vietnam.

225 "Supported by big data, CITIC Bank seeking profit from POS Internet lending," *Security Times*, January 14, 2014. See *China's digital transformation: The Internet's impact on productivity and growth*, McKinsey Global Institute, July 2014.

Furthermore, new technology-powered business models, including P2P lending, crowdfunding, and Internet-based microlending companies, have the potential to expand SMEs' access to capital. Like Kickstarter, Crowdfunder, and Quirky in the United States, the Australian platform Pozible has launched thousands of small projects and companies.[226] China's Ali Finance, JD.com, and Baidu are classic examples of innovative Internet-based microlending operations. Ali Finance, for example, can obtain real-time customer credit ratings by monitoring and analyzing e-merchants' transactions on Alibaba's e-commerce marketplaces as a step in providing small loans for working capital; it has achieved a non-performing loan ratio of 0.7 to 1.3 percent, well below the industry's average for unsecured consumer loans.[227] While it would be challenging to replicate Ali Finance's model, given its unique access to data from its e-commerce ecosystem, alternative business models have proven to be successful in their innovative use of data to expand access to capital. In the United States, for example, Kabbage makes use of unconventional data such as transaction patterns, UPS shipping data, and even the number of Twitter followers to make decisions about offering loans to small online sellers.[228] This kind of tech-enabled innovation can increase the availability of financing for SMEs.

We estimate that these technologies could lead to a 16 to 33 percent increase in lending to SMEs, with a potential improvement of lending margins, based on research done on other countries such as China. This translates into a $2 billion to $6 billion rise in annual revenue for the banking sector by 2030.[229] In a region where SMEs account for more than 95 percent of all enterprises and generate over 50 percent of domestic employment, increased financing of small businesses could fuel broader economic growth, job creation, and entrepreneurship.[230]

- **Internet and mobile payment platforms in online and offline retail.** Internet and mobile payment platforms can have the dual effect of increasing revenue and decreasing costs for both online and traditional brick-and-mortar stores, driving a total annual impact of $1 billion to $6 billion for the finance sector by 2030. Mobile payments could create a substantial boost in consumption among the large population that lacks credit cards or other financial accounts. As with mobile banking, regulatory frameworks will need to address new players in the payment space that may not be traditional financial institutions.

  For example, 2C2P is an online payment platform founded in Thailand. Customers using its "123 service" receive a bar code or reference number upon their online checkout; they can bring it as a printout, as a number copied on paper, or on their smartphone to a designated location to make payment.

226 Damon Poeter, "Crowdfunding site Pozible promotes Chinese innovators," *PC Magazine*, April 24, 2014.

227 *China's digital transformation: The Internet's impact on productivity and growth*, McKinsey Global Institute, July 2014.

228 *India's technology opportunity: Transforming work, empowering people*, McKinsey Global Institute, September 2014.

229 This assumes that the technology-enabled increase in lending to SMEs in ASEAN is similar to that achieved in China.

230 *ASEAN SME policy index 2014: Towards competitive and innovative ASEAN SMEs*, Economic Research Institute for ASEAN and East Asia research report number 2012–8, in cooperation with OECD, June 2014.

Upon confirmation that payment has been made, merchants ship the goods to the customers.[231] Another solution that has been taking root in the region is carrier billing; Coda Payments, an Indonesian firm, allows online merchants to charge customers using prepaid airtime on their mobile phones.[232] On the cost side of the equation, third-party Internet payment systems can reduce merchant transaction costs. In China, for example, Alipay serves as "soft" point-of-sale systems requiring no installation fees and minimal or no transaction fees.

- **Digitization of marketing, distribution, and services.** Financial institutions have built online channels for distribution, marketing, and customer interactions, leading to cost savings and efficiencies. In Asia, McKinsey has estimated that some institutions could boost net profits by up to 30 percent by lowering costs through digitization. Some of the largest savings can come from improving the channel mix to reduce distribution costs, decreasing administration and operating costs with automation, and optimizing IT spending through use of the cloud and agile development. Historical trends show that digital channel usage has been on the rise in emerging Asia, growing by more than 30 percent from 2007 to 2011.[233] This general shift, coupled with the rise of the affluent middle class in ASEAN, bolsters the business case for banks to justify the investments and fixed costs that are required to focus on digital customers. In Singapore, for example, branchless banking is most popular in the higher-income and younger segments.[234]

  We estimate that the potential cost savings for the banking sector in ASEAN could lie in the range of $7 billion to $11 billion annually. This is based on the assumption that distribution and service costs can be reduced by 30 to 50 percent, which has been achieved in cases from China and Europe. It should be noted, however, that individual banks could lose market share or their margins could erode as a result of aggressive new competition from non-traditional players. Anywhere from 10 to 29 percent of net profits could be at risk.[235] Banks will have to counter these issues by maximizing productivity gains in their back-office operations and staying at the forefront of industry innovation.

Realizing the full potential of disruptive technologies will hinge on policy action. In fact, respondents in our recent business survey in the region cited restrictive regulations as a major barrier that could impede technology adoption. Regulators will need to provide clarity regarding whether existing regulatory frameworks will be extended to cover new business models such as Internet finance.

231 2C2P, www.2c2p.com/index.aspx.

232 Jon Russell, "Coda Payments brings transactions to all mobile phones, launches with Indonesian operator Axis," The Next Web, February 12, 2013.

233 McKinsey Asia PFS Survey 2011, which profiled about 20,000 customers in 13 Asian countries. For more on this topic, refer to *The changing face of Asian personal financial services*, McKinsey & Company, September 2011.

234 *Digital banking in Asia: Winning approaches in a new generation of financial services*, McKinsey & Company, January 2014.

235 Ibid.

For technology to drive financial inclusion, regulation will have to evolve. Banking regulators are accustomed to dealing with traditional financial institutions, but in many cases (including Kenya's), mobile banking services have been introduced by telecom companies that fall outside their normal purview. Indonesia is reviewing rules requiring customers to visit a branch to open accounts, and the Philippines has revised a regulation that requires agents to undergo formal training in Manila; these types of requirements make it difficult for mobile transactions to gain traction.[236] In addition, the unbanked segments of the population, which traditionally have been costly to serve, may not become a priority for private-sector banks without a policy push for expanding financial inclusion, such as India's Pradhan Mantri Jan Dhan Yojana initiative.[237] Our expert interviews highlighted the need for national blueprints that provide clarity on the regulatory regime and a policy stance on financial inclusion, as well as measures to make such initiatives more economically viable. Indonesia, Malaysia, and the Philippines, for example, have outlined strategies for financial inclusion.[238] Independent national efforts can also be supported by coordinated regional efforts. The Consultation with Southern Market Leaders in Financial Services for the Poor, for example, brought together leaders from Cambodia, Laos, Myanmar, and Vietnam to identify recommendations for doubling financial inclusion in ASEAN by 2020.[239]

To increase the likelihood of success, the region will need a private-sector player that is willing to invest in building a sizable network of agents, typically sourced from telecommunication operators or small shops, and focus on a well-defined range of services during the launch period; it will also require a long-term commitment to build this market, as it usually takes three to five years for mobile banking to become profitable.[240] Indeed, most markets already have the other ingredients in place for tech-enabled financial inclusion; the right regulations and institutions that are willing to go after the unbanked segments are now the key missing pieces of the puzzle.

The role of governments will also be critical in championing data sharing, a crucial prerequisite for any robust credit system that will facilitate wider access to credit for unbanked individuals and underserved SMEs alike. Clear boundaries need to be defined for privacy protection, and penalties need to be established for fraud. This will also be critical in mitigating the operational risks involved with digitization,

236 Ben Bland, "Indonesia falls behind in mobile banking," *Financial Times*, August 24, 2014. See also M. Yasmina McCarty and Gerald Rasugu, "Designing and delivering agent training for mobile money deployments," *GSMA—Mobile Money for the Unbanked*, September 20, 2012.

237 KR Srivats, "Pradhan Mantri Jan Dhan Yojana to be rolled out on August 28," *The Hindu Business Line*, August 20, 2014.

238 *Putting financial inclusion on the global map: The 2013 Maya Declaration progress report*, Alliance for Financial Inclusion, September 2013.

239 *Doubling financial inclusion in the ASEAN region by 2020: Outcome report of the Consultation with Southern Market Leaders in Financial Services for the Poor*, CARD Mutually Reinforcing Institutions, UN Capital Development Fund, 2014.

240 *Regional economic outlook: Sub-Saharan Africa—Sustaining growth amid global uncertainty*, IMF, April 2012; Eric Duflos et al., *Microfinance in Myanmar: Sector assessment*, International Finance Corporation and Consultative Group to Assist the Poor, January 2013. See *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

which could cause a negative impact of 5 to 6 percent on net profits in certain institutions in Asia.[241]

Our survey revealed that the high up-front investment associated with building digital channels is another barrier. Banks throughout Asia have significantly underinvested in IT, but given that new digital competition can erode both market share and margins rapidly, financial institutions will have to act decisively.[242] A lack of skills, especially for the use of big data and advanced analytics, is another key obstacle.[243] Banks will need to define their talent-sourcing and development strategy, striking a balance between bankers and digital experts.

### Infrastructure: Maximizing existing assets and streamlining delivery of new projects

Southeast Asia faces an infrastructure challenge of enormous proportions, as discussed in Chapters 2 and 3. The region needs to focus on building fundamental road, rail, and port infrastructure where it is lacking if it hopes to capture a greater share of global production and trade. With more than 90 million people expected to move to cities through 2030, governments need to plan ahead for the infrastructure (and the housing and commercial space) to handle this increased urban density. Together these needs will likely require investment of up to $7 trillion across the region—an amount roughly double the current GDP of Germany. Making every dollar of investment count is critical given the scale of the region's needs. Previous MGI research has identified five main strategies for making infrastructure more productive: improving project selection, making the most of existing infrastructure, streamlining delivery, ensuring strong infrastructure governance and capabilities, and developing a robust funding framework.[244] Chapter 3 contains a fuller discussion of how the region can adopt these best practices.

Technology can play a part in optimizing infrastructure investment. A starting point for most of the emerging economies of ASEAN would be to make greater use of basic technologies. This includes risk-simulation packages that can improve the accuracy of the bidding process and online sourcing platforms to reduce procurement costs. However, more sophisticated technology applications related to the Internet of Things and big data analytics can also go a long way toward supporting these goals, especially with regard to making existing infrastructure handle more demand, thus reducing the need for new build-outs (for example, spacing takeoffs and landings more precisely on existing runways so that airports do not have to build new ones). They can power sophisticated project management systems that make delivery more efficient, thereby avoiding the cost overruns and delays that too often plague large-scale construction. We estimate that disruptive technologies can produce $47 billion to $74 billion in annual economic impact by 2030 from improved infrastructure productivity, consumer surplus, and cost savings (Exhibit 46).

241 *Digital banking in Asia: Winning approaches in a new generation of financial services*, McKinsey & Company, January 2014.

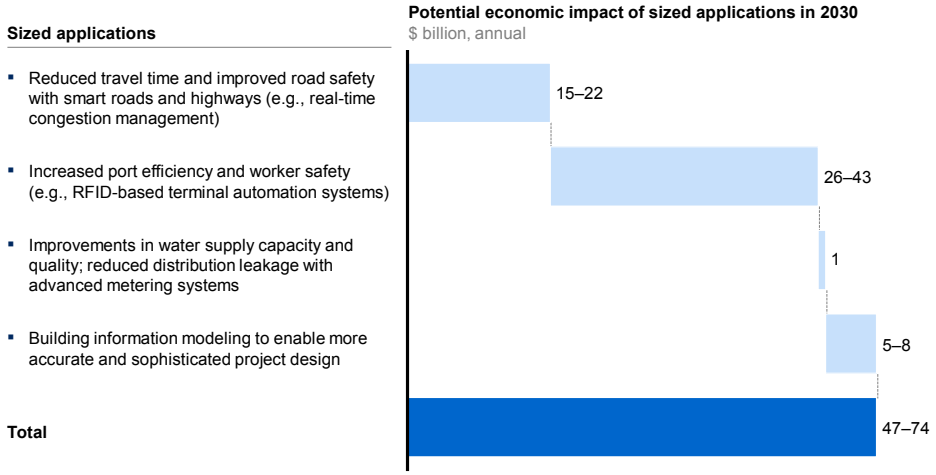
242 Ibid.

243 *The hype and the hope: The road to big data adoption in Asia-Pacific*, Economist Intelligence Unit, November 2013.

244 *Infrastructure productivity: How to save $1 trillion a year*, McKinsey Global Institute, January 2013.

## Exhibit 46

### Incorporating disruptive technologies into infrastructure management and construction could create almost $75 billion in economic impact by 2030




NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute analysis

The Internet of Things and big data analytics, for instance, are at the heart of so-called intelligent transportation systems that improve the flow of traffic. In Singapore, dynamic electronic road pricing makes use of RFID technology to identify bottlenecks and raise congestion pricing for vehicles.[245] Similarly, Mumbai adjusts traffic signals with adaptive traffic control systems that use nearly 700 vehicle-presence detectors to count the number of cars at intersections; this system has reduced travel times by 12 percent.[246] Congestion has become a severe issue for Asia's megacities; one study found that traffic in Jakarta alone was estimated to cost some $5 billion in 2010, most of which was from lost productive time and extra fuel.[247] Increasing the mobility of people and goods by relieving epic traffic jams could have a real impact in the region; as urbanization continues, this will be a critical challenge for ensuring that cities are sustainable and livable.

The Internet of Things and big data analytics can also make port management more efficient. Today, the costs of ports and terminal handling range from $120 per container in Malaysia to $278 in Brunei, while the time involved ranges from one day in Singapore to four and a half days in Myanmar.[248] Technologies that can optimize logistics would be crucial in increasing ASEAN's share of global trade. RFID-based automation systems, which monitor RFID-tagged vehicles and equipment as well as cargo, can be used to plan the flow of cargo, assets, and vehicles across terminals in real time. Thousands of RFID transponders are used by Singapore, the second-busiest port in the world, to track, place, and

245 Singapore Land Transport Authority website and Ministry of Transport website.

246 Schneider's Smart Solutions, www.constructionopportunities.in/IssueDetailPage?IssueMenuMasterId=1230&ParentMenuId=1175&ContentType=SubParent. See also "Traficon awarded major smart intersection control contract in India," Traficon, March 15, 2011.

247 Andreas D. Arditya, "Congestion costs Jakarta Rp 46 trillion," *The Jakarta Post*, March 16, 2011.

248 Doing Business Survey, World Bank, 2014.

locate cargo containers, as well as to manage arrival and departures.[249] The Port Technology Research and Development Programme, which will receive almost $40 billion in funding over five years, continues to focus on innovations in port automation, intelligent planning and control systems, and even green port solutions.[250]

Big data-related technologies can revamp the way agencies plan infrastructure projects and manage their construction. Advanced 5D building information modeling (BIM) systems can cut costs by enabling value engineering; sophisticated multidimensional models incorporating time and cost ensure design accuracy and feasibility to minimize re-work. Actual construction time can be streamlined by using technology to coordinate all the complex aspects of a large-scale project, consolidating all the information in a centralized command center. Apps on mobile devices can also improve on-the-ground efficiency. Bechtel, for example, has created an in-house app called "Documents" for engineers to create, update, and share technical information anywhere, including with teams in the field.[251]

In an industry that is still very much paper-based, these types of systems could shift the construction culture from "going with your gut" to more evidence-based decision making; they can also improve the transparency of public spending on infrastructure. Previous MGI research has shown that streamlined project delivery can lower infrastructure costs by approximately 15 percent, and we believe some 10 to 15 percent of that saving can be unlocked by technologies that eliminate many of the inefficiencies in construction.[252]

These technologies require significant up-front investment, however; the cost of sensors and actuators would need to fall in order to spark widespread use in demand management.[253] The cost may slow adoption unless decision makers develop a greater awareness of what demand management technologies and project management systems can do. In the United Kingdom, some £95 million of research into smart cities has been funded by Research Councils UK, and £50 million has been earmarked for a Future Cities Catapult Centre focused on urban innovation.[254] Initiatives such as these can improve global understanding of how big data and the Internet of Things can transform infrastructure investment and management. Private investors, public-private partnerships, and foreign direct investment from multinational construction and engineering firms may encourage a push toward incorporating the latest technology into infrastructure projects.

249 J. Narsoo, W. Muslun, and M. S. Sunhaloo, "A radio frequency identification (RFID) container tracking system for Port Louis Harbor: The case of Mauritius," *Issues in Informing Science and Information Technology*, volume 6, 2009.

250 "MPA and PSA extend Memorandum of Understanding on developing container port technologies," Maritime and Port Authority of Singapore and PSA Corporation Ltd. press release, April 11, 2014.

251 "Better building with iPad," iPad in Business, Apple corporate website.

252 Previous studies have found that 5D design and construction management technology can reduce costs by 15 to 25 percent. We apply here a 10 to 15 percent cost saving as a conservative estimate. See *Infrastructure productivity: How to save $1 trillion a year*, McKinsey Global Institute, January 2013. See also *India's technology opportunity: Transforming work, empowering people*, McKinsey Global Institute, September 2014.

253 *Disruptive technologies: Advances that will transform life, business, and the global economy.* McKinsey Global Institute, May 2013.

254 "New initiative to support $40 billion smart cities in the UK," Department for Business, Innovation and Skills press release, October 9, 2013.

Planning agencies will need to develop greater capabilities and skills to identify, evaluate, and implement the right technologies—but gaining the ability to monitor the progress of infrastructure projects closely is also crucial to making them more efficient. In Singapore, the Infrastructure Development Program seeks to address the talent shortage in the industry, offering university students internships with project developers, consultancies, project finance banks, and others in the sector.[255] Separately, the Malaysian Developers Council has urged the government to review its foreign labor policy to address skills shortages that can slow infrastructure projects.[256] Indeed, countries across ASEAN need to prioritize talent development, perhaps collaborating on a regional basis. Planning agencies will also need to increase their focus on maintaining and optimizing existing infrastructure assets, perhaps through the use of demand management technologies, rather than defaulting to new construction.

### Education: Improving access and learning outcomes

Much of Southeast Asia is engaged in a debate about the most effective ways to expand access to education and improve learning outcomes—and how to fund these efforts. Technology-based instruction and school management systems hold the promise of potentially bringing better education and vocational training to even the most remote villages and islands of Southeast Asia, and to enhance teaching quality and student achievement across the board. This would be a critical step forward in addressing the skills gap, especially in Cambodia, Laos, and Myanmar, where less than 10 percent of the working population has attained secondary schooling.[257] Many classrooms have limited access to up-to-date textbooks and learning materials, but the mobile Internet and cloud technology could make it possible for students to log on and gain the benefits of cutting-edge curricula delivered via mobile phones, tablets, or e-books. Technology could accelerate and scale up efforts to build more inclusive education systems, and if it is deployed effectively, it could play a role in solving the fundamental challenges of access and consistent, high-quality teacher training.

Many efforts to harness the power of the Internet for education have been launched around the globe. ReKindle Learning, a South African startup, is based on the premise that simple mobile phones are particularly well suited to reinforcing lessons with additional drill questions that students can follow at their own pace.[258] Other initiatives provide students with more sophisticated hardware: Uruguay was one of the first nations to provide all students with free laptops, and Turkey has launched the FAITH program, which aims to deliver millions of tablets.[259] However, large-scale efforts to provide students with laptops or tablets in locations ranging from Thailand to Los Angeles to Kenya have run into

255 Chia Yan Min, "Moves to help Singapore act as region's hub for infrastructure," *The Straits Times*, April 1, 2014.

256 Haziq Hamid, "Labour shortage worries developers," *The Edge*, March 22, 2013.

257 World Bank Education Statistics (Barro-Lee data set); working population here refers to the population above 25 years of age.

258 *Lions go digital: The Internet's transformative potential in Africa*, McKinsey Global Institute, November 2013.

259 Michael Trucano, "Big educational laptop and tablet projects: Ten countries to learn from," World Bank Edutech blog, July 31, 2013. See also S. Pouezevara, *Turkey's FAITH project: A plan to conquer the digital divide, or a technological leap of faith?* RTI International and the Education Reform Initiative, December 2013.

implementation problems.[260] Before undertaking large-scale investment, policy makers need to carefully address transparency in procurement, integration into the curricula, teacher training, security and replacement policies, and ongoing evaluation of learning outcomes; it is also important to plan ahead for sustaining such programs, given the continuing evolution of technology.[261]

Despite the challenges involved, new innovations based on the mobile Internet, the cloud, and big data can improve the quality of education at all levels. MOOCs (massive open online courses) can expand virtual enrollment, complement classroom teaching, and be combined with interactive coursework that uses big data-driven adaptive learning tools. In the United States, Arizona State University partnered with Knewton, an adaptive learning startup, to offer more computerized math courses. This resulted in an 18 percent improvement in pass rates and a 47 percent decrease in student withdrawal rates for remedial math classes.[262] This model can work for younger students as well: DreamBox Learning, an online software provider, has developed an intelligent adaptive learning engine that teaches math to primary school students in an individualized game-based environment, while Khan Academy combines video tutorials with interactive exercises that rely on algorithms to determine when a student should move to more challenging material.[263]

ASEAN faces a widespread shortage of teachers, and adding more qualified English instructors will be of particular importance throughout the region as AEC integration progresses and English becomes entrenched as the language of business. The problem is particularly acute in ASEAN's lower-income member states. Myanmar, for instance, has a teacher-to-pupil ratio of 1:28, compared with 1:16 in Indonesia and 1:13 in Malaysia.[264] Disruptive technologies can change this picture—not only by expanding access to education for students but also by delivering more effective teacher training, development, and support programs.

For instance, 1BestariNet is a project spearheaded by Malaysia's Ministry of Education in partnership with YTL Communications, to equip 10,000 primary and secondary public schools with high-speed 4G Internet access so that they can make use of Frog VLE, a cloud-based virtual learning forum. Among its services is the Frog Community Site, which allows teachers to share best practices with other educators across the country, join groups to stay updated on subjects of their interest, and access resources such as classroom aids.[265] Technology-driven school management systems can streamline administration, while student testing and evaluation can provide more hard data on learning outcomes, improving transparency and accountability.

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260 Sasiwimon Boonruang, "Get smart," *Bangkok Post*, July 2, 2014; Howard Blume, "L.A. Unified halts contract for iPads," *Los Angeles Times*, August 25, 2014; and Margaret Wahito, "Kenya: Sh24.6 billion laptops tender cancelled," AllAfrica.com, March 12, 2014.

261 Michael Trucano, "10 principles to consider when introducing ICTs into remote, low-income educational environments," World Bank Edutech blog, July 8, 2013.

262 *Learning to adapt: A case for accelerating adaptive learning in higher education*, Education Growth Advisors, March 2013. See also *India's technology opportunity: Transforming work, empowering people*, McKinsey Global Institute, September 2014.

263 DreamBox Learning website and Saomya Saxena, "Khan Academy's new learning dashboard," *EdTech Review*, March 22, 2014.

264 Pupil-teacher ratio, primary, *World development indicators*, World Bank, 2010.

265 Frog Asia, www.frogasia.com/v3/faq/.

Many of these technologies can also be extended to vocational education, where simulated learning systems can be effective. The use of immersive learning software, virtual reality displays, and motion sensors can help bridge the skills gap by enabling students to practice skills and be evaluated in a risk-free environment. These systems can be used to train larger cohorts of students than traditional one-on-one training programs. In the United Kingdom, students from MidKent College can practice their welding techniques using a simulated welding kit, which is inexpensive and allows them to practice as much as required to perfect their skills.[266]

Based on research conducted in India and elsewhere, disruptive technologies in education can contribute to improvement in secondary graduation rates, in turn boosting labor productivity by 1.5 to two times. Technology could similarly improve the availability and effectiveness of vocational training, allowing for a doubling of labor productivity compared to those who have attained only primary education.[267] All in all, disruptive technologies in education could bring about $36 billion to $53 billion in annual productivity gains by 2030.

The region will have to address many barriers in order to capture this potential, starting with the availability and quality of digital infrastructure. Aside from Singapore, Malaysia, and Brunei, broadband penetration reaches less than a third of households across the region. New technology applications such as video streaming, up- and downloading of audiovisual files, educational gaming, and live virtual tutoring will continue to be highly dependent on faster and higher-capacity broadband connections. Across the world, policy makers are realizing the need for better connectivity. In Nigeria, funding ($100,000 for each school) and support from the Universal Service Provision Fund was used to deploy the Intel Learning Series Solution to provide broadband connections that link government schools, libraries, and institutions across the nation to underserved and rural areas.[268] Policy makers have to establish this as a priority in order to mobilize the level of investment that is needed. ASEAN's ICT Masterplan 2015 (AIM 2015) has championed the goal of providing broadband to every school in the region. In Malaysia, for example, the government's Smart School program has so far connected more than 80 percent of primary schools (70 percent in rural areas) and 95 percent of secondary schools (but only 5 percent in rural areas) with broadband.[269]

Flexibility and openness to new teaching practices will also be critical. Given that these technologies are meant to complement the work of educators, teachers will need to be properly trained in order to make full use of educational technologies and to help students benefit from these tools both inside and outside of the classroom. Content will also need to be adapted and translated to local contexts and languages. Thailand's "One Tablet Per Child" policy was hampered by the lack of teacher training, and the lessons provided on the devices did not account for regional differences in learning abilities, causing those at lower levels

266 *The use of e-learning and digital simulations in technical education and work-based skills in the UK*, British Council, 2014.

267 *India's technology opportunity: Transforming work, empowering people*, McKinsey Global Institute, September 2014.

268 *Technology, broadband and education: Advancing the education for all agenda*, Broadband Commission Working Group on Education and UNESCO, January 2013.

269 *Universal service policy for the provision of broadband to every school in ASEAN member countries*, International Telecommunication Union, October 2013.

of literacy to struggle with the activities offered.[270] To tackle such issues, the Teacher Education in Sub-Saharan Africa initiative provides a wealth of materials in a variety of formats and languages to support teachers in their use of open educational resources.[271]

Finally, accreditation of various initiatives will also be important for wide-scale adoption. Especially in ASEAN, where paper qualifications are regarded as carrying some weight, certification can provide quality assurances and help boost uptake and completion rates. Some universities are just beginning to accept MOOC credits toward degrees; more than half of the students at the Massachusetts Institute of Technology take a MOOC, for instance.[272] The accreditation of MOOCs in basic education systems is trickier and will need to be carefully mapped to national curricula. Governments can also set up common standards for accreditation. In Brazil, for instance, students completing online courses take a common government-run exam.[273]

### Manufacturing: Enhancing service and optimizing costs

In manufacturing, disruptive technologies can increase profit margins and lower costs, driving $25 billion to $45 billion of annual economic impact by 2030. The use of big data and the Internet of Things can enhance demand forecasting and production planning to improve customer service levels, thus boosting profit margins. On the cost side of the equation, analyzing detailed, real-time data on everything from suppliers' inventory and shipments in transit to downstream customer demand allows manufacturing companies to tighten inventory control and maximize production capacity.

Indeed, volatility of demand has been a critical issue for manufacturers. Customers have often pushed hard for increased flexibility and responsiveness from suppliers in response to rapidly changing consumer preferences. For manufacturers of consumer goods, this challenge is likely to amplify as ASEAN's affluent middle class continues to grow and as retailers begin to expand their use of promotions and tactical pricing. Based on previous research, we estimate that better demand forecasting, demand shaping, and supply planning could improve profit margins by 2 to 3 percent as it enables manufacturers to avoid stock-outs and to cater to spikes in demand.[274] To go the extra mile, data can be integrated from retail customers, including promotional details (items, prices, sales), launch plans (specific items to be listed/delisted, ramp-up/ramp-down plans), and inventory levels (stock levels per warehouse, sales per store).[275] Fifteen percent of ASEAN respondents in a recent survey were optimistic that big data's ability to

270 Antony Harfield and Ratchada Viriyapong, "Facing the challenges of the One-Tablet-Per-Child policy in Thai primary school education," *International Journal of Advanced Computer Science and Applications*, volume 4, issue 9, 2013.

271 Open Educational Resources are teaching, learning, or research materials that can be freely used, adapted, and redistributed. See *Technology, broadband and education: Advancing the education for all agenda*, Broadband Commission Working Group on Education and UNESCO, January 2013.

272 "The future of universities: The digital degree," *The Economist*, June 28, 2014.

273 "Creative destruction," *The Economist*, June 28, 2014.

274 In the long run, however, economic theory suggests that supernormal profits will be competed away. See *Big data: The next frontier for innovation, competition, and productivity*, McKinsey Global Institute, June 2011.

275 Ibid.

improve forecasting accuracy could boost revenue or efficiency for their company by more than 50 percent.[276]

The key technologies we have identified can also allow manufacturers to optimize operating costs. Embedding networked sensors into key points in the supply chain and into production equipment can generate real-time, highly granular data that can be synthesized to reduce waste and maximize output. Within the "four walls" of the factory, sensors in machinery can signal the need for preventive maintenance so that equipment breakdowns do not result in downtime. RFID technology also allows for improved workflow management. Singapore's YCH Group reduced stock turnaround time by 20 percent in a 220,000-square-foot warehouse of close to 3,000 stock-keeping units by using RFID systems for more accurate pallet sorting.[277]

Interviews with industry experts suggest that manufacturers are likely to reap the largest gains from deploying technology beyond the "four walls" of the factory. Technology can produce notable results when it connects the entire value chain, including suppliers, distributors, and downstream retail customers. GPS sensors allow for constant location monitoring so that drivers can be deployed on the most optimal routes. Alerts can be sent via mobile Internet networks if drivers diverge from the route or if unexpected bottlenecks are detected. Sensors can measure environmental variables such as humidity, temperature, shock, and vibration to ensure that goods are kept safe in transit and to facilitate insurance claims if they are not. Smart tags on pallets can generate warnings when dangerous goods are placed next to flammable materials.[278]

Given the extent of supply-chain fragmentation in the region, being able to track shipments and optimize their routes would be of great value to manufacturers. Although extensive use of RFID technology beyond the manufacturing plant might still be prohibitively costly, developments in smartphone apps can provide cheaper and simpler alternatives for digital supply chain and transport management. Cloud Logistics' transportation management system, for example, provides global visibility of workflow and shipments that can be accessed via smartphone, while Ontime's Envoy app allows fleet tracking on Android phones.[279]

The key for manufacturers will be recognizing the value creation and cost savings they can achieve and then acquiring the highly specialized skills needed to design robust algorithms.[280] Companies will need to recruit or groom three types of talent: deep analytical talent to execute big data analyses, managers and analysts who know how to request and consume these analyses, and supporting technology personnel focused on implementation. A basic statistics program or a series of classes in data analysis at a local college or university, for instance, could create a team of better-trained managers and analysts. The financial

276 *The hype and the hope: The road to big data adoption in Asia-Pacific*, Economist Intelligence Unit, November 2013.

277 "YCH Group selects Intermec fixed vehicle computer to improve supply chain management," Intermec by Honeywell case studies, 2010.

278 Alberto Bielsa, Mark Boyd, and Alicia Asín, "Wireless sensor networks enhancing the efficiency and safety of logistics operations," *Libelium World*, January 30, 2012.

279 Company websites.

280 Markus Löffler and Andreas Tschiesner, "The Internet of Things and the future of manufacturing," *McKinsey on Business Technology*, number 30, 2013.

services firm Capital One established Capital One University as an internal training institute on testing and experiment design.[281]

Surveys confirm that manufacturers today do not consistently maximize use of the large volumes of data they collect.[282] Connecting the entire supply chain would entail coordinating multiple players, which could prove challenging. For instance, the cost of RFID tags is closely linked to whether they will be reused or disposed, which relies on close partnership with downstream partners. Changing this picture will require overcoming misaligned incentives, as distributors who have greater bargaining power today may be unwilling to implement Internet of Things technologies that could shift that balance in favor of manufacturers or even end retailers. Manufacturers will need to consider relationships with research institutes and distributors while keeping select, high-value-adding technology functions in-house in order to reap the benefits in their own operations as well as in the supply and distribution chains.[283] Technology providers will also need to agree on standards for interoperability between sensors, computers, and actuators for the Internet of Things to achieve scale.

Lastly, manufacturers should also be on the lookout for opportunities to produce the very devices, such as tablets and smartphones, that will support the expansion of technology throughout Southeast Asia. In the short term, ASEAN's relatively low labor costs, coupled with the rise in its consuming class, gives it a competitive edge in attracting the manufacturing operations of high-tech companies that wish to optimize costs and locate closer to end-markets.[284] In 2013, Samsung joined Intel and Nokia in relocating some operations from China to Vietnam to protect profit margins.[285] To continue capturing such opportunities in the long term, however, the upward pressure on wages suggests that manufacturers should start preparing for the shift to higher-value-added manufacturing (see the discussion in Chapter 2).

### The impact of technology in other key sectors

The profiles above illustrate the potentially transformative effects of technology on ASEAN's economy. But disruptive technologies will reach far beyond these four sectors.

The productivity of the **agriculture** sector varies from $1,300 in output per worker per year in Myanmar to $2,500 in Malaysia and Thailand.[286] But advances such as hybrid and genetically modified crops, precision farming, and the mobile Internet can help to close these gaps and improve yields across the region.[287] In particular,

281 *Big data: The next frontier for innovation, competition, and productivity*, McKinsey Global Institute, June 2011.

282 *The data directive, How data is driving corporate strategy, and what still lies ahead*, Economist Intelligence Unit, commissioned by WiPro, April 2013.

283 *Manufacturing the future: The next era of global growth and innovation*, McKinsey Global Institute and McKinsey Operations Practice, November 2012.

284 Damian Chan, "Manufacturing beyond China," Forbes Asia, August 25, 2014.

285 Jungah Lee and Jason Folkmanis, "Samsung shifts plants from China to protect margins," Bloomberg, December 12, 2013.

286 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

287 "Precision farming" refers to the use of sensors and soil, weather, and water data based on geographic information services to guide decisions on inputs and processes such as what to plant and where, planting times, watering, and fertilizer use.

the mobile Internet can extend the reach and effectiveness of extension services. It can also provide farmers with market information on demand and prices; almost 22,000 farmers, for instance, use the *1677 Farmer Information Superhighway in Thailand for this purpose.[288] Tagging and tracking technologies associated with the Internet of Things also facilitate tighter supply-chain control to reduce food wastage.[289]

In **health care**, disruptive technologies can expand access to medical care in underserved areas through telemedicine, remote patient monitoring, and digital tools that help health-care workers without full medical training follow basic protocols and even diagnostics. In Malaysia, for example, a teleradiology hub (the Diagnostic Services Nexus) is being developed under the nation's Economic Transformation Programme to enhance the quality and accessibility of radiological services.[290] These technologies will be critical in alleviating the shortage of trained health-care workers in the region, estimated to exceed a million.[291] Electronic medical records can help various providers take a more holistic and consistent approach to treating individual patients, and at a broader level, combining them can facilitate more efficient hospital administration and public health policy (including faster responses to disease outbreaks). Tagging and tracking technologies can create tighter control of pharmaceuticals to reduce abuse and counterfeit drugs. And over a longer horizon, scientists around the world are working at the cutting edge of advanced genomics in the hope that personalized medicine could one day reduce deaths from cancer, cardiovascular disease, and diabetes.

There is still room for improvement in e-government across Southeast Asia but **government services** can be delivered much more efficiently, transparently, and cost-effectively when citizen services move online. In Singapore, the Online Business Licensing System is a cross-agency platform providing a one-stop website for new businesses; it slashed average license processing times from 21 to 12.5 days.[292] Advanced algorithms and big data analytics can also reduce fraud and error in transfer payments and tax collection.

Finally, in the **consumer and retail** sector, we believe that the largest gains will come from productivity improvements due to e-tailing. Although starting off from a low base of $3.3 billion in 2013, representing 0.7 percent of the total retail market, e-tailing is forecast to post a compound annual growth rate of 18 percent to reach $7.6 billion in 2018.[293] Consumers will reap enormous surplus in the form of lower prices and better product selection. Retailers can also improve inventory management by reducing stock-outs, thanks to better demand forecasting enabled by big data and Internet of Things technologies.

288 Kowsher Jahan Khaled, "Mobile changes lives of Thai farmers," *The Daily Star*, December 19, 2013.

289 *India's technology opportunity: Transforming work, empowering people*, McKinsey Global Institute, September 2014.

290 "EPP 5: Creating a Diagnostic Services Nexus," Economic Transformation Programme.

291 "Critical shortage of trained health workers hampering the delivery of health services," World Health Organization South-East Asia Regional Office press release, September 7, 2012.

292 Jeannie Chua, "The e-transformation journey of Singapore," in *National Strategies to Harness Information Technology*, Nagy K. Hanna and Peter T. Knight, eds., Springer, 2012.

293 Euromonitor.

## MUCH OF THIS POTENTIAL IS NOT EASILY ATTAINABLE WITHOUT A CONCERTED PUSH FROM THE PUBLIC AND PRIVATE SECTORS

There is little doubt that capturing all the potential value associated with new technologies would be highly challenging. In addition to the barriers described in the sector profiles above, we find that some obstacles cut across all parts of the economy (Exhibit 47). First and foremost, many parts of the region have to build out digital infrastructure where it is lacking. Skills are also a critical concern. It will take specialized high-tech capabilities to use big data analytics, for instance, but even more fundamentally, the region will have to address basic digital literacy in the workforce and the broader population so that more can benefit from technologies.

**Exhibit 47**

**To realize the full potential of these technologies, ASEAN will need to overcome multiple barriers**


1 Includes unsized sectors (whose GDP represents ~25–30% of ASEAN GDP).
SOURCE: McKinsey Global Institute analysis

Even where the requisite infrastructure and human capital are present, however, public- and private-sector leaders alike may not understand the potential economic value at stake. They may hesitate because of the up-front investment that is required and uncertainty about the returns that such investment would produce, particularly in the short term. In many cases, adopting a truly disruptive technology requires changing deeply entrenched behaviors. This may entail

developing trust in cashless payments, encouraging teachers to change the way they run their classrooms, or adopting a more big data-driven decision-making process where managers once operated on gut instinct alone. Addressing language differences may also be needed to overcome this demand-side barrier to technology adoption. Digitally delivered content and services, as well as technological devices and interfaces, will require tailoring to local language. Existing industry regulations, too, may constrain the growth of new technology-driven business models.

Policy makers and businesses of all sizes will have to contend with how to capture the opportunities presented by new breakthroughs and how to mitigate the disruptions they could create. Technology will also have implications for average citizens, as it has the ability to reshape the labor force, create substantial consumer surplus, and, perhaps most profoundly, improve the quality of life in myriad ways.

### Changing the composition of the labor market

Technology has been reshaping the labor force since the Industrial Revolution and continues to do so at an accelerated rate. Today's disruptive technologies are likely to lead to some job losses as existing activities become increasingly automated. Workers in clerical functions or routine customer service will need to adapt and learn new digital skills to carry out higher-value tasks. As technologies develop, even some of the work that requires specialized knowledge, such as legal and professional services (accounting, for example), could be automated as the intelligence of computing machines improves. MGI's global research suggests that knowledge work automation tools and systems could take on tasks that are equivalent to the output of 110 million to 140 million full-time workers around the world in 2025.[294]

We estimate that technologies related to the automation of knowledge work in ASEAN have the potential to generate productivity gains that could displace some seven million to nine million workers employed in knowledge-based jobs in 2030, ranging from clerical and customer service staff to business process outsourcing and IT workers. Efficiency improvements such as automated supply chains and assembly lines in manufacturing, the move from traditional brick-and-mortar stores to e-commerce platforms, and next-generation construction methods and IT-enabled project management could yield productivity benefits that eliminate an additional five million to eight million jobs by 2030. In all, 6 to 8 percent of ASEAN's total non-farm labor force in 2030—or 12 million to 17 million workers in non-farm jobs—could be displaced by technology (Exhibit 48).[295] These job losses are likely to occur before new jobs enabled by technology are created and could exacerbate the existing challenges of unemployment among university graduates in many ASEAN countries.

294 *Disruptive technologies: Advances that will transform life, business, and the global economy*, McKinsey Global Institute, May 2013.

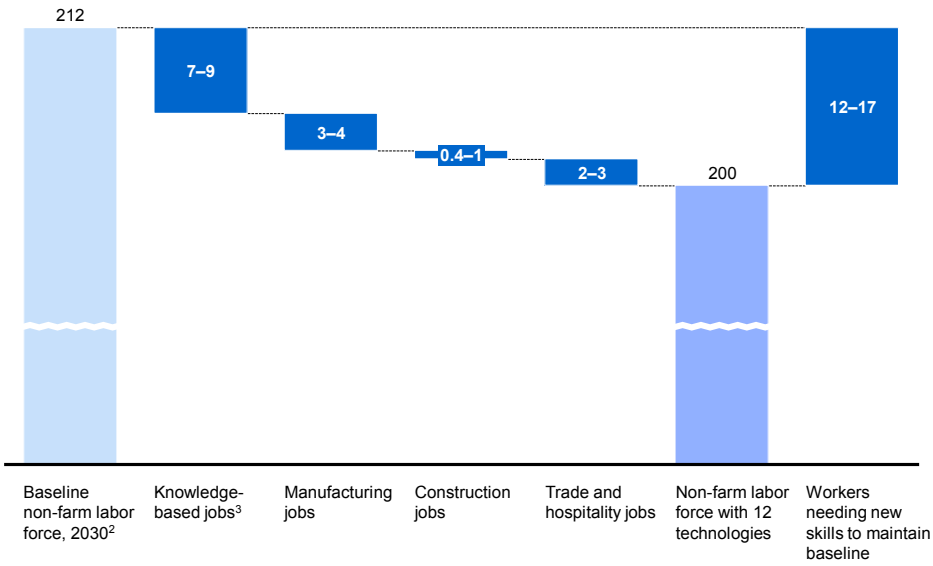
295 In addition to the five main disruptive technologies that are the focus of this chapter, others that could have a significant impact on jobs due to potential productivity gains are included. For example, in construction, we also consider next-generation construction methods such as prefabrication. While we have not included the impact on farming jobs, technologies such as precision farming could have an impact on workforce productivity in this sector.

**Exhibit 48**

**Millions of non-farm jobs could be affected by new technologies, implying a need for new employment opportunities and training**

Non-farm jobs potentially impacted by technology in ASEAN, 2030[1]

Million




1 Comprises Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.
2 Non-farm labor force is calculated as total labor force less employment in agriculture.
3 Knowledge-based jobs in functions such as clerical and administration, legal, finance, engineering, teaching, and general management (e.g., algorithms to support teachers with adaptive learning, for more automated credit decisions, and for fraud and error detection in transfer payments).

NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

But the picture is not uniformly dire for jobs. Recent MGI research in China suggests that the net impact from Internet applications on the total number of jobs could be neutral to slightly positive given the size of new markets that the Internet creates.[296] Globally, an MGI survey of more than 4,800 small and medium-sized enterprises found that as they adopted Internet technologies, 2.6 jobs were created for every job that was lost.[297] And while the Internet causes labor market disruption, it can also provide some tools to help address it through online learning that empowers workers and opens up new avenues for productive work. Furthermore, the backdrop of strong economic growth in ASEAN will likely cushion the impact of jobs losses due to automation.

Nonetheless, the composition of the labor market will shift. Even as some jobs are eliminated, workers with digital skills will be in high demand—and there may be an acute shortage of workers who specialize in programming, data science, and user experience design. This is already becoming evident: in 2012, estimates revealed a shortage of more than 250,000 professionals with networking skills across eight countries in the Asia-Pacific region. This shortage is projected to increase to over

296 *China's digital transformation: The Internet's impact on productivity and growth*, McKinsey Global Institute, July 2014.

297 *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity*, McKinsey Global Institute, May 2011. Results from the surveyed businesses were gathered from Canada, China, France, Germany, India, Italy, Japan, Russia, South Korea, Sweden, the United Kingdom, and the United States.

480,000 by 2016, representing a 31 percent shortfall of highly skilled workers in certain tech roles.[298]

### Policy challenges

- **Work with the ICT industry to resolve key infrastructure bottlenecks and improve the reach, cost, and quality of Internet services.** The disruptive technologies that will empower ASEAN depend on access to affordable, reliable, and far-reaching Internet infrastructure. Member states have widely varying starting points, but increasing demand for connectivity, bandwidth, and speed suggests that investment and upgrading will be required across the region. A robust Internet infrastructure includes sufficient access to international bandwidth, as well as a healthy national core network, backhaul, and "last-mile" access infrastructure across fixed and mobile.

  Governments could play a role in facilitating this development in four ways. First, they can set five- to 10-year goals regarding the affordability, quality, and reach of ICT services. Governments that have outlined national ICT agendas with clear implementation roadmaps (such as Singapore's 2005 Intelligent Nation 2015 Masterplan) have been more effective in stimulating the industry. Second, policy makers can identify critical infrastructure gaps and encourage the industry to resolve them through regulatory approaches and incentives. In some cases, public-private partnerships can attract the necessary investment. Malaysia, for example, entered into a partnership with Telekom Malaysia and subsidized some 20 percent of fiber infrastructure investment, which accelerated and extended the rollout beyond what a private-sector entity alone would likely undertake considering only the business case.[299] Appropriate incentive models are particularly important for addressing the digital divide between urban and rural areas. Third, governments can review spectrum policies to stimulate more efficient use of this scarce resource. This could involve tracking progress in freeing up the UHF spectrum currently used for analog terrestrial broadcasting and considering the best use of this spectrum for the future. In Australia, Chile, and Brazil, for example, the 700 MHz band has been reallocated for wireless broadband use, vastly improving the total capacity available and allowing higher-speed services.[300] Fourth, governments can encourage more infrastructure sharing across fixed and mobile, which can lower the capital expenditure required for network building by up to 40 percent and accelerate rollout.[301] However, this will have to be done in a way that is equitable to infrastructure owners so as not to penalize historical investment.

298 Essential networking skills refer to basic or core networking skills, network security, IP telephony (IPT) and wireless networking. Emerging networking skills refer to skills in technologies such as unified communications, video, cloud computing, data centers, and virtualization. The countries analyzed included Australia, India, Indonesia, Korea, Malaysia, the Philippines, Thailand, and Vietnam. See William Lee, *The evolution of the networking skills gap in Asia/Pacific*, International Data Corporation, June 2013.

299 "TM HSBB public-private partnership project," Malaysian Wireless press release, September 16, 2008.

300 "LatAm joins Asia-Pacific in standardizing LTE on 700 MHz," Telecoms.com, February 12, 2013.

301 *Myanmar's moment: Unique opportunities, major challenges*, McKinsey Global Institute, June 2013.

- **Establish a policy framework for data collection and sharing as well as online privacy.** Capturing the value of big data, the Internet of Things, and the cloud depends on creating a safe and predictable environment for data collection, storage, and usage across business entities and even across country borders. This is an especially important prerequisite for building a robust credit system, moving toward a more integrated health-care system with electronic medical records, and encouraging innovation with open data. Data privacy laws and regulations have been introduced in Malaysia, the Philippines, and Singapore in recent years, but many areas of uncertainty remain. A balanced set of regulations governing the kinds of data companies can share, the boundaries of such sharing (including whether it can be shared across borders), the types of usage that are not allowed, and the type of consumer consent that is required could address the obstacles. For example, in considering whether data can go beyond a country's borders, governments need to balance concerns of national security and incentives for local investments with the business case for cloud investments, since border restrictions would reduce economies of scale. Standards for interoperability of data can also help expand the scope for innovation with open data.

- **Reinforce regulations concerning cybersecurity and ensure a safer Internet.** Indonesia, Malaysia, the Philippines, and Thailand, among other countries, have already experienced cyberattacks.[302] The threat from cybercrime is real and growing for consumers and businesses alike. Global entities ranging from major retailers to health systems have been hacked in recent months, resulting in the theft of personal data pertaining to millions of consumers. Cybersecurity has to be incorporated into all types of operations and regarded as an ongoing investment and priority. Policy makers in ASEAN countries could consider defining a national cybersecurity agenda based on an analysis of cyberthreats and weaknesses in current policy frameworks; their responses may include new governance structures for addressing cybercrime and policies for protecting children online.

- **Ease the dislocation in the labor market.** Ensuring that workers have the necessary skills to succeed in a more digital economy is a challenge for the entire region. Policy makers can address this issue by embedding ICT skills into the curricula at all levels of education and creating incentives for on-the-job training. Other initiatives could include working with the media and industry to raise the prominence and recognition of high-tech careers and investing in vocational education programs. Governments will also have to ensure that workers whose jobs are eliminated by technology have avenues for retraining and support. Malaysia, for example, has set up a skills development center in Penang that has trained more than 150,000 participants as well as informing national policies for transforming the Malaysian workforce.[303] Enlisting the private sector could make these types of efforts more effective so that training programs and other resources reach workers who need to refresh their skills throughout their careers. Aligning educational curricula with actual demand can build a true education-to-employment pipeline.

302 Measured by the percentage of PCs that experienced a malware attack, whether successful or failed, over a three-month period. See *Security threat report 2013: New platforms and changing threats*, Sophos, 2013.

303 Penang Skills Development Centre (PSDC) website.

- **Support SMEs in technology adoption.** Across the region, SMEs account for more than 95 percent of all enterprises and generate more than 50 percent of domestic employment.[304] Supporting their adoption of information technologies could bring about significant economic growth. While many multinationals are actively incorporating new technologies into their processes, SMEs tend to be much further behind and have limited awareness of how emerging technologies could be relevant for their businesses; as a result, they are often less productive and competitive than their larger counterparts. Some promising programs have been launched to address the information gap, such as Singapore's SPRING iSprint (Increase SME Productivity with Infocomm Adoption and Transformation), which assists SMEs with technology adoption. Governments could consider offering incentives for SMEs to modernize their basic business systems through cloud-based programs for accounting, payroll administration, and supply-chain management, for example. Governments could also consider targeted training programs for SMEs, create special ICT development zones, or establish funding to encourage the development of innovative technology solutions specifically for SMEs. Going one step further, governments can foster vibrant startup scenes by establishing support networks, incubators, and financing programs for entrepreneurs. In addition to Blk 71 in Singapore (profiled earlier in this chapter), Malaysia has created the Star Accelerator Fund, which allocates $6.4 million for startups.[305] An overall business-friendly environment, with features such as streamlined processes for setting up new businesses, would contribute to such an ecosystem.

- **Set the tone and take the lead.** Governments can create momentum by championing technology adoption, such as moving to e-government services, making their own data sets publicly available, and paving the way for smart cities. In Singapore, for instance, the government portal data.gov.sg makes available over 8,000 data sets from more than 60 agencies; this information has been used to crowdsource innovations for the public good. Educhoices is a mobile app that came out of the Apps4SG competition, providing students and parents with convenient access to information on school entry requirements and course details.[306] Other initiatives in the region include the OD4Transparency Project, an effort of the Indonesian and Philippine governments to make public data accessible and to strengthen civil society's ability to monitor the use of public funds. MSC Malaysia, a special economic zone, is another example of the public sector taking the lead to create an environment that is conducive to innovation; it aims to attract high-tech investment, support local innovation, and lay the foundations for smart cities. Additionally, governments can shift to e-procurement, which would spur many vendors and contractors to integrate the use of technology in their own businesses.

304 *ASEAN SME policy index 2014*, Economic Research Institute for ASEAN in cooperation with OECD, June 2014.

305 MSC Malaysia website.

306 Kelly Ng, "Singapore government to share more data to spur social innovation," FutureGov, January 9, 2014.

### Challenges and opportunities for businesses

- **Understand the imperatives.** Technology is no longer simply a budget line; it is the enabler of virtually any strategy. Companies need to be ready to invest resources (including management focus, time, and effort as well as capital) if they hope to stay ahead of the curve. Yet less than a third of respondents in the survey we conducted report that disruptive technologies are one of the top three strategic priorities for senior management or that their companies are thought leaders in technology. Leaders need to know what technology can do and how to bend it to their strategic goals. They cannot afford to wait until technologies are fully baked to think about how they will work for—or against—them.

- **Rethink the skills mix of your workforce.** Workers who can combine knowledge of a given sector with sophisticated technology skills will be in high demand. Companies that can identify, source, attract, and retain such talent will have an edge—and larger firms may make targeted acquisitions of small tech firms to make a leap forward. Companies may need to develop their own talent pipelines by training existing employees or partnering with education providers. Leaders also need to review existing organizational structures so that tech talent is not sequestered in an IT department but is integrated into all of the company's processes. In the short term, outsourcing may be required to meet immediate demands.

- **Partner with governments and other industry players.** There is considerable overlap between the business agenda and the public policy agenda. Companies will need to work closely with governments to build the foundation for deploying these technologies (such as skills, standards, and infrastructure) while taking a thoughtful approach to some of the broader social side effects. BlackBerry, for example, supports skill development in Indonesia with a BlackBerry Innovation Center in the Bandung Institute of Technology that provides university students with knowledge and experience.[307] Companies may also need to become more open to partnerships and outside collaboration, including upstream suppliers as well as downstream vendors and consumers.[308] For example, successful e-tailing marketplaces could provide logistics, marketing, or payment services to support e-merchants. Lastly, even competitors may collaborate to fully develop the ecosystem's value. AT&T, Cisco, General Electric, IBM, and Intel, for example, formed the Industrial Internet Consortium in March 2014 with an eye toward establishing standards for the Internet of Things.[309]

- **Reinforce cybersecurity and good data stewardship.** Companies across all sectors will need to set up safeguards throughout their operations to protect their computers and networks, programs, and data, including customer information. Regaining trust after a single privacy breach could be a significant challenge. It can also be costly: the average security compromise was

307 *Fiscal 2013 corporate responsibility report*, BlackBerry, November 2013.

308 Hugo Sarrazin and Johnson Sikes, "Competing in a digital world: Four lessons from the software industry," *McKinsey on Business Technology*, number 28, winter 2012.

309 *China's digital transformation: The Internet's impact on productivity and growth*, McKinsey Global Institute, July 2014.

estimated to cost $136 per record across nine countries in 2012, due to efforts required in detection, notification, and remediation as well as customers lost.[310]

- **SMEs: Take the plunge.** A McKinsey online survey of SMEs in the formal sector found that Internet usage appeared high in the region (broadband penetration was at 84 and 86 percent of firms for Vietnam and Malaysia, respectively), but a smaller proportion are using e-business solutions such as online customer service and supply-chain management (45 to 55 percent in Vietnam).[311] The advent of the mobile Internet and the cloud makes it far easier and cost-effective for small companies to digitize their operations and to scale up and expand their reach quickly. Outside collaboration has also been made more convenient and less costly. Indeed, the average Malaysian SME believes Web technologies have led to revenue increases of 9 percent and have reduced the cost of goods sold by 7 percent.[312] Technology disruptions in the banking sector will help give SMEs greater access to capital, allowing them to make IT investments that previously may have been beyond their reach. SMEs would be well served to keep abreast of the latest applications of technology and to evaluate which innovations could be cost-effective and yet strategically important.

□ □ □

The potential benefits of technology for developing countries are enormous, but so are the challenges. The innovations described here could generate some $220 billion to $625 billion in economic impact for ASEAN by 2030, but more broadly, they can accelerate productivity growth and modernize sectors across the regional economy. There is large value at stake for businesses and countries that move quickly to take advantage of these innovations and carve out competitive positions early. Perhaps most exciting, applications such as remote health care, mobile money, e-learning, and more transparent government services can make a tangible difference to the poorest segments of society across Southeast Asia if the region's leaders realize the magnitude of the upside potential and successfully address the barriers to adoption.

310 *2013 cost of data breach study: Global analysis*, Ponemon Institute, May 2013.

311 *Online and upcoming: The Internet's impact on India*, McKinsey & Company Technology, Media, and Telecom Practice, December 2012.

312 *Online and upcoming: The Internet's impact on aspiring countries*, McKinsey & Company Technology, Media, and Telecom Practice, January 2012.

# Appendix: Technical notes

1. Economic impact
2. City growth and consumer demand
3. Required infrastructure and real estate investment
4. Barriers to adoption of disruptive technologies
5. Assessment of current levels of integration by sector

## 1. ECONOMIC IMPACT

The specific approach used to estimate economic impact in 2030 varies across each of the three major economic trends profiled in this report. For some aspects (such as benefits from ASEAN integration and implementation of the Trans-Pacific Partnership), we draw on academic literature concerning the macroeconomic impacts. In other cases, we adapt international estimates of benefits to the ASEAN context by identifying relevant scaling factors. In still others, we have performed our own bottom-up sizing of the potential opportunity. While each economic opportunity called for a slightly different methodology, we have used consistent sources across all three for baseline assumptions (GDP growth estimates, for example, are all from IHS).

The main impact in each case comes from productivity improvements, although in some cases, we assume benefits from increased workforce participation. Because we are exploring complex trends with multiple variables unfolding over ten countries, any effort to estimate their potential GDP impact is subject to error. Our goal in deriving these estimates is not precision but rather to convey the magnitude of the economic opportunities that could be realized. It should also be stressed that each case is a partial-equilibrium analysis and that impacts associated with the three economic forces cannot be simply added together to arrive at an overall GDP impact.

In contrast to previous MGI work on game changers for the US economy, this research sizes the full impact of each economic opportunity rather than the incremental impact.[313] This approach was taken because of the difficulties of identifying a rigorous "baseline" across multiple economies from which to calculate incremental impact. Given the uncertainty and variables involved, we estimated a range of impact rather than a point estimate. Below we describe the approach in further detail for each of the three economic trends profiled in this research.

### Global flows

This opportunity encompasses the economic impact from completion of the ASEAN Economic Community (AEC) integration plan as well as the impact from new trade agreements between ASEAN and other countries.

#### *Low upside impact case*

A 2009 study found that a complete elimination of tariff and non-tariff barriers, liberalization of five service sectors, AEC-induced changes in foreign direct investment, and a 5 percent reduction in trade costs could increase the region's GDP by 5.3 percent versus the baseline.[314] We use an IHS forecast that projects ASEAN's GDP will reach $5.3 trillion in 2030 as our baseline and estimate that the AEC's GDP impact would be about $282 billion.[315]

313 *Game changers: Five opportunities for US growth and renewal*, McKinsey Global Institute, July 2013.

314 Michael G. Plummer and Siow Yue Chia, eds., *Realizing the ASEAN Economic Community: A comprehensive assessment*, Institute of Southeast Asian Studies, 2009.

315 A more recent estimate of the impact of the AEC suggested that it could result in economic growth being 7.1 percent higher by 2025 than under the baseline forecast for the ASEAN region. We use the 5.3 percent estimate above as a low case for the potential upside. For further details on this other report, see *ASEAN Economic Community 2015: Managing integration for better jobs and shared prosperity*, Asian Development Bank and the International Labour Organisation, August 2014.

*High upside impact case*

For the high upside estimate, we incorporate the additional impact of ASEAN successfully concluding major free trade agreements currently under negotiation. It has been estimated that these would boost GDP by 11.6 percent.[316] Specifically, this assumes that ASEAN can conclude bilateral free trade agreements with the United States, Europe, and other key Asia-Pacific countries in addition to completing AEC integration. We estimate the upside impact to be about $617 billion based on projected GDP in 2030.

### Urbanization

The GDP impact from urbanization comes from three separate components:

- **Job mix effect.** As people move from rural agriculture into employment in urban manufacturing and services, they become more productive and earn higher wages, which raises living standards in both the city and the countryside. High urban wages attract more workers to the cities and reduce rural populations.

- **Economies of scale.** Beyond changes in employment, cities offer the critical mass and density required to produce economies of scale and network effects, which in turn boost productivity. For example, the productivity of a city with 200,000 people is, on average, 3 to 8 percent higher than one with 100,000 residents.[317] This is due to a variety of advantages that generally come with large size. Large urban centers attract talented and skilled individuals, who come for the superior range of opportunities, and firms are more competitive due to knowledge spillovers. Size also produces economies of scale in many other ways, such as concentrating larger groups of consumers, providing better access to inputs, and making it possible to deliver public services more efficiently.

- **Infrastructure and real estate spending impact.** We estimated additional impact from ASEAN countries investing in infrastructure and real estate in line with GDP growth to sustain development, much of which relates to urban areas.

The three categories do contain some areas of overlap, but we minimized this issue by excluding the economic impact from the operations of infrastructure, some of which may arguably overlap with the job mix and agglomeration effects. We have taken a conservative approach in our estimates by, for example, excluding the rural benefits of urbanization (for example, the extra demand for agricultural products) and scaling urban infrastructure spending by population rather than by GDP.

316 Peter A. Petri, Michael G. Plummer, and Fan Zhai, "The ASEAN Economic Community: A general equilibrium analysis," *Asian Economic Journal*, volume 26, number 2, June 2012.

317 Stuart S. Rosenthal and William C. Strange, "Evidence on the nature and sources of agglomeration economies," in *Handbook of urban and regional economics*, 1st ed., volume 4, J. V. Henderson and J. F. Thisse, eds., Elsevier, 2004.

*Low upside impact case*

- **Job mix effect.** To estimate the upside from having a larger urbanized workforce, we began with the historical urbanization rate of the ASEAN region from 1994 to 2012, which was about 0.6 percentage points per annum, and assumed that the region will continue to urbanize at approximately the same rate until 2030. We then calculated individual ASEAN countries' population in 2030 and the resultant urban population in each. On a weighted average basis, ASEAN urbanization will increase from about 45.3 percent in 2012 to about 56.1 percent by 2030. From this projected urban population, we determined the resultant urbanized workforce in 2030 using the labor force participation rates across each ASEAN country. We then estimated each ASEAN country's GDP upside from having a larger urbanized workforce compared with an agricultural workforce by multiplying the difference between the productivity of the agricultural sector vs. urban sectors such as retail trade and manufacturing. This upside is estimated to be roughly $226 billion in 2030.

- **Economies of scale.** Based on academic literature, we assume that every doubling of the urbanized population raises GDP by 8 percentage points.[318] This does not include the mix effect of productivity gains from a more urbanized population undertaking work in more urban sectors as opposed to agriculture, which is estimated separately. After multiplying the increase in the percentage of urbanized population by the above-mentioned effect, we estimate the impact at about $47.9 billion in 2030.

- **Infrastructure and real estate spending impact.** The last addition to the GDP impact from urbanization is from the infrastructure and real estate investment required to sustain GDP growth. This includes both core infrastructure (power, water, transport, and so on) and real estate. For infrastructure, investment levels are determined by what is required for each country to maintain capital stock at 70 percent of GDP—that is, maintaining infrastructure investment growth in line with GDP growth and replacing capital stock as it depreciates at 2.5 percent per year. For real estate, the amount of investment is based on forecast floor space requirements multiplied by building costs. We converted this infrastructure spending in 2030 to GDP impact using a construction multiplier. The GDP impact is scaled using the urban share of the population to account for only urban infrastructure. This impact is estimated to be about $249 billion. This figure does not include the GDP contribution from operating the infrastructure assets in subsectors such as transportation, utilities, and real estate.

Adding up the impact from a larger urban workforce, agglomeration benefits in economies, and infrastructure and real estate investment yields about $523 billion of GDP impact.

318 Ibid.

*High upside impact case*

- **Job mix effect.** We calculated the high upside GDP estimate using the same methodology as the low upside case. However, we utilized a higher urbanization rate of 1.2 percentage points per annum (compared with 0.6 percentage points per annum). We based this on the average of countries that have managed to urbanize rapidly in at least a 15-year time period (Brazil, China, Japan, the United States, and South Korea). The impact is therefore estimated to be about $467 billion.

- **Economies of scale.** No change from low upside case.

- **Infrastructure and real estate spending impact.** Based on previous MGI work, we made the assumption that ASEAN countries are able to prioritize and execute projects more effectively, thus improving the productivity of higher infrastructure spending by 40 percent.[319] We estimated this impact by assuming that governments could effectively build 40 percent more infrastructure at the same cost as before and gain additional returns from this additional infrastructure. However, we conservatively estimated that ASEAN will achieve the 40 percent productivity improvements for only 10 percent of the time period between 2014 and 2030. This accounts for time required by ASEAN countries to acquire the requisite skills and capabilities. This impact from urban infrastructure spending is estimated to be about $417 billion. This does not include the GDP contribution from operating the infrastructure assets in subsectors such as transportation, utilities, and real estate.

Adding these three impacts together yields $932 billion of GDP impact in 2030.

### Disruptive technologies

We estimated the impact of each of the 12 disruptive technologies identified in MGI's recent research on this topic, which estimates the global impact of each.[320] We estimated the share of impact from disruptive technologies on ASEAN based on ASEAN's share of the global economy. We further adjusted the potential impact based on the relevance of the technologies to key sectors within the region. For example, technologies such as autonomous vehicles are likely to be less relevant in many ASEAN countries than in other parts of the world.

*Low upside impact case*

We estimate that ASEAN's share of the global impact of these disruptive technologies is in line with its contribution to global GDP, based on the low case of potential economic impact from MGI's past research.

We further adjusted the impact based on applicability of the technologies to ASEAN based on expert interviews. To do this, we segmented ASEAN countries into three groups: ASEAN-Developed (Singapore and Brunei), ASEAN-Developing (Malaysia, Indonesia, the Philippines, Thailand, and Vietnam), and Frontier (Myanmar, Cambodia, and Laos). For each segment, we determined a degree of relevance for each disruptive technology. For example, through expert interviews, we deemed 3D printing to be of low relevance to the ASEAN-Developing

319 *Infrastructure productivity: How to save $1 trillion a year*, McKinsey Global Institute, January 2013.

320 *Disruptive technologies: Advances that will transform life, business, and the global economy*, McKinsey Global Institute, May 2013.

countries but of medium relevance to the ASEAN-Developed segment. This methodology was repeated for each of the disruptive technologies in turn. We then adjusted ASEAN's "share" of the global impact that we previously estimated using GDP.

The low upside economic impact from disruptive technologies in ASEAN is estimated to be about $217 billion in 2030.

*High upside impact case*

We arrived at the high upside GDP estimate using the same methodology described above, but we assumed that ASEAN will capture its share of the global impact in line with its share of global GDP contribution based on the high case of potential economic impact from MGI's past research. The high upside economic impact from disruptive technologies in ASEAN is estimated to be about $625 billion in 2030.

## 2. CITY GROWTH AND CONSUMER DEMAND

To estimate the growth of cities from 2012 to 2030, we constructed a model that built on McKinsey's existing Cityscope database but refined growth estimates to obtain more detail and extend the forecasts to 2030 (from the previous forecast year of 2025).

We refer to cities as integrated metropolitan areas rather than specific city jurisdictions, aggregating neighboring cities into a single urban center where appropriate (one example of this is Metro Manila). In total, there are 235 ASEAN cities in the Cityscope database: 128 in Indonesia, 34 in the Philippines, 31 in Thailand, 15 in Malaysia, 15 in Vietnam, nine in Myanmar, and one each in Cambodia and Laos (Singapore is of course a city-state).

The city-level GDP forecasts are based on estimates of population and GDP per capita growth. Where historical data are available, we project 2030 city populations based on historical rates of growth, subject to caps to bring growth rates in line with national urban population growth in the longer term. Where historical data are unavailable, we estimate growth based on data from the United Nations, which is available for cities with populations above 750,000.[321] GDP per capita data comes from a combination of national statistical offices (e.g., Badan Pusat Statistik for Indonesia) and third-party data providers (C-GIDD). Where historical city-level data were available, we assumed that GDP per capita grew in line with historical rates, subject to caps to bring the numbers in line with overall forecast national growth rates. Where only provincial data were available, we assumed that all cities within the province grew at the same rate (and so differences in GDP growth will be influenced only by differences in population growth).

To estimate city-level consumer demand for a variety of goods in 2030, we worked with AC Nielsen to estimate historical demand for seven categories of goods (laundry detergent, facial moisturizer, shampoo, diapers, instant noodles, soft drinks, and ready-to-drink tea) in five countries (Indonesia, Malaysia, the

321 *World population prospects: The 2012 revision*, United Nations, Department of Economic and Social Affairs, Population Division, June 2013.

Philippines, Thailand, and Vietnam). We excluded data from Singapore since it is a city-state, and data for the other ASEAN countries unfortunately were not available. The demand data for each country varied in terms of its level of geographical detail. In some cases, it matched well with the Cityscope list of cities. In other cases, data were available only at the provincial level, and to derive estimates for cities, we assumed that consumer demand for a given city matched its share of provincial GDP.

To forecast demand for these goods to 2030, we used the McKinsey Global Growth Compass, which uses econometric techniques to estimate future demand for different consumer goods based on how product categories have taken off historically in countries around the world at various income levels. Typically, product adoption follows an "S" curve pattern, starting with a "warm-up zone," in which the product is too expensive for most buyers, followed by a "hot zone," which is reached when a critical mass of customers can afford the product and sales rise rapidly. Eventually, sales stabilize in the "chill-out zone," when the market is saturated. This income level varies significantly by type of good.

### 3. REQUIRED INFRASTRUCTURE AND REAL ESTATE INVESTMENT

To estimate the region's required investment between 2012 and 2030, we analyzed infrastructure (roads, rail, ports, airports, power, water, and telecom) and real estate (residential and commercial) requirements for all the ASEAN countries. We forecast future investment for infrastructure based on what would be necessary to maintain capital stock at 70 percent of GDP after allowing for depreciation of 2.5 percent per year. This was based on past MGI work that found core infrastructure stock to be on average 70 percent of GDP for most developed countries.[322] This is a conservative estimate, as it does not account for the starting point of countries' stock, which is likely to be lower than 70 percent across ASEAN (although there is a lack of historical investment data for many ASEAN countries).

To estimate a potential level for real estate investment, we compared the 2013 relationship between floor space per capita and GDP per capita in residential and commercial real estate across ASEAN countries, using data from Pike Research and IHS. We then assumed this relationship holds constant and forecast 2030 floor space requirements based on expected GDP per capita. We converted this to an investment level using construction cost data for each country from Turner and Townsend's 2012 international construction cost survey.

322 *Infrastructure productivity: How to save $1 trillion a year*, McKinsey Global Institute, January 2013.

## 4. BARRIERS TO ADOPTION OF DISRUPTIVE TECHNOLOGIES

To assess the factors that could slow adoption of the disruptive technologies in each of the sectors highlighted in Chapter 4, we used a framework that identifies three types of barriers.

### Incentive barriers

- **Lack of understanding of the opportunity.** These failures occur when actors do not have sufficient information about the true nature of the benefits and costs of the technology. For example, many businesses are unaware of the potential savings they could be achieving by applying the Internet of Things to their operations.

- **Maturity of the technology.** The degree to which the opportunity is dependent on unproven technologies or technologies that have not yet reached commercial/industrial scale matters. We consider only technologies that are known today and only those that require ramp-up along an accepted learning curve. However, some of these technologies still may not be widely used. For example, 3D printing is being used in many niche applications in the manufacturing industry, but it is not yet widely applied in other areas such as oil and gas.

- **Up-front investment requirements.** In some cases, realizing the opportunity has high capital costs relative to the "business-as-usual" option, and these initial costs may discourage businesses.

- **Insufficient expected return on investment.** There may also be questions surrounding whether adoption of a given technology will yield an attractive rate of return to the private sector, based on current prices and risk.

### Decision-making barriers

- **Misaligned incentives.** These occur when there is a misalignment of incentives between actors in an organization (e.g., employee incentive targets are short term, while the benefits of technology are usually realized over the long term) or within a sector (e.g., incumbent industry leaders may have the capabilities to innovate but they may not have the incentives to do so as it could threaten their standing).

- **Coordination issues.** In some cases, actors must coordinate for there to be incentive to act. For example, with the Internet of Things, the benefits are created when all firms across the value chain adopt compatible networks of sensors.

- **Entrenched behavior.** It is harder to capture opportunities based on technology if that technology requires users to adopt significant changes in behavior or mindset. One example is getting customers to become comfortable using mobile phones for their banking transactions.

### Implementation barriers

- **Supply-chain bottlenecks.** Gaps in the supply chain may prevent access to critical components needed to capture an opportunity.
- **Lack of skills.** Workers may need advanced digital skills to utilize some of these technologies.
- **Lack of physical infrastructure.** The infrastructure needed for technology adoption (e.g., broadband internet connections) may not be in place.
- **Financing constraints.** A lack of access to capital markets increases the difficulty of investing in new technologies.
- **Restrictive regulations.** Existing regulations may preclude the adoption of some technologies. For example, many countries impose significant restrictions on the development of genetically modified crops.
- **Lack of government strategy to champion adoption.** Governments may not have the regulatory structures in place to support implementation (e.g., lack of relevant standards or protocols; lack of defined property rights).

In each of these subcategories, we have assessed the degree of difficulty associated with each technological application and assigned each one a rating that ranges from "readily achievable" to "difficult." We have used these ratings to denote the feasibility of capturing the opportunities in each of the sectors shown in Chapter 4.

## 5. ASSESSMENT OF CURRENT LEVELS OF INTEGRATION BY SECTOR

We examined progress on ASEAN integration in four areas: free flow of goods, free flow of services, free flow of investment, and free flow of skilled labor. We created an overall index by calculating a simple average of the scores in each of the four areas. The methodology focuses on integration in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Laos, Cambodia, Myanmar, and Brunei were excluded due to lack of available data for many of the assessed dimensions, and Singapore was excluded so as not to skew the results. The methodology used to assess integration in each of these four areas is described below.

### Free flow of goods

The assessment for the free flow of goods was based on a simple average of the levels of ASEAN integration in nine areas:

- **Elimination of tariffs (tariffed goods).** The extent of tariff elimination within each country and sector was scored as the inverse of the percentage of total product lines within each sector that continue to have tariffs imposed on imports. The number of existing tariffs was based on the countries' tariff schedules published by the ASEAN Secretariat, and the number of total product lines was based on the ASEAN Harmonized Tariff Nomenclature system.[323] The dimension was scored from 0 to 100, with a score of 0

323 Tariff Schedules, ASEAN Secretariat. Retrieved from www.ASEAN.org/communities/ ASEAN-economic-community/item/annex-2-tariff-schedules.

indicating tariffs applying to all product lines and a score of 100 indicating no tariffs applying. For example, if 98 percent of products within a given sector had tariffs, the sector received a score of 2 out of 100.

- **Size of remaining tariffs (tariffed amount).** This dimension was scored as the inverse of the value of the imposed tariff as a percent of the value of the product. The sector score is an average of all remaining tariffs in that sector in a given country.[324] The dimension was scored from 0 to 100, with a score of 0 indicating that tariffs are applicable to 100 percent of the value of the product.

- **Non-tariff measures.** Progress on the elimination or harmonization of non-tariff measures (NTM) was scored as the inverse of the percentage of product lines within each sector (within each country) with non-tariff measures still imposed, excluding standards and technical regulations (which are a separate dimension, described below). NTMs include administrative charges, certificates of approval, import licensing (including automatic, non-automatic for sensitive products, and selective approval of importers), import permits, quantity-control measures (such as licensing and quotas), internal taxes (including excise, income, luxury, and VAT), prohibition (import bans or restrictions on sensitive products), monopolistic measures (single channel for imports), compulsory national transport, and quotas. Depending on their nature, NTMs can constitute trade barriers if they are not removed or harmonized. The ASEAN Secretariat has identified the following measures as non-tariff barriers to intra-regional trade: customs surcharges; technical measures and product characteristic requirements; and monopolistic measures. In our assessment, we first calculated the number of product lines within each sector on which NTMs are imposed on imports from other ASEAN countries, as published in the ASEAN Secretariat's Non-Tariff Measures database.[325] This number was divided by the total number of product lines within each sector, based on the ASEAN Harmonized Tariff Nomenclature. The dimension was scored from 0 to 100, with a score of 0 indicating all product lines had NTMs attached and a score of 100 indicating that no NTMs were applicable for that sector.

- **Standards (standards/regulations).** Progress on harmonization of standards and regulations within each sector (and each country) was benchmarked against global best practices (i.e., as a percentage of the global best practice performance). Because Singapore is the best ASEAN performer in terms of non-harmonized standards/regulations (averaged across sectors) and also ranks first in the world for ease of trading across borders in the World Bank's Doing Business index,[326] it was used as a proxy for global best practice. This dimension captures standards and technical regulations (non-tariff measure codes commencing with 8), including phytosanitary certificates; patent laws; product registration (including with Ministries of Health); quality standards; labeling; inspection and health certificates; pre-shipment inspections; testing, inspection, and quarantine; and proper slaughter. The number of product lines in each sector was based on the ASEAN Harmonized Tariff Nomenclature. The number of non-harmonized standards and technical regulations was determined by reference to those declared in the ASEAN Secretariat's Non-

324 Ibid.

325 Non-Tariff Measures database, ASEAN Secretariat, accessed at www.ASEAN.org/communities/ASEAN-economic-community/item/non-tariff-measures-database.

326 Ease of Doing Business index, World Bank, accessed at www.doingbusiness.org/.

Tariff Measures database. Where product lines have both a standard/technical regulation and another non-tariff measure (as captured in the previous dimension) attached, it is captured in both dimensions. This dimension was scored from 0 to 100, with a score of 0 indicating all product lines were subject to non-harmonized standards or technical regulations, and a score of 100 indicating global best practice.

- **Trade procedures (single window status).** This dimension is based on each country's progress toward implementation of the National Single Windows (NSWs), an online platform facilitating customs declaration and clearance for trade. The NSWs are designed to facilitate the free flow of goods by standardizing information parameters, procedures, and formalities relevant for customs clearance. A score of 0 indicates no action has been taken as yet, a score of 50 indicates partial progress toward NSW customs processing, and a score of 100 indicates live operations of the NSWs.[327]

- **Trade procedures (single window trade).** This dimension assesses the volume of trade conducted through the respective National Single Windows, once the platform is live in each country. The score was calculated as the percentage of total trade for that sector (in each country) that is currently conducted through the NSW platform. This data was sourced via respective national customs websites and through media searches.

- **Trade procedures (logistics).** The logistics dimension was scored according to the World Bank Logistics Performance index: efficiency of customs clearance process.[328] In the World Bank index, "efficiency" is defined as speed, simplicity, and predictability of formalities. Index scores range from 1 to 5, and we re-weighted these to scores out of 100. A score of 100 indicates "best practice" efficiency of customs clearance processes.

- **Trade procedures (trade speed).** The trade speed dimension was calculated as the inverse of each country's performance, as a percent of the global worst practice. Trade speed performance was based on the World Bank's Doing Business Survey (days to import/export).[329] The World Bank defines "procedures" as including document preparation, customs clearance and technical control, ports and terminal handling, and inland transportation and handling. A score of 0 indicates that a country is equivalent to the global worst performer in customs speed.

- **Trade procedures (trade cost).** The trade cost dimension was calculated as the inverse of each country's performance, as a percentage of the global worst practice. Trade cost performance was calculated according to the World Bank Doing Business Survey (cost to import/export).[330] The average of the cost to import and cost to export was taken, both in US dollars. The World Bank defines "procedures" as including document preparation, customs

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327 Information comes from two sources due to differences in country coverage: Jonathan Koh and Andrea Feldman Mowerman, *Towards a truly seamless single windows and trade facilitation regime in ASEAN beyond 2015*, Economic Research Institute for ASEAN and East Asia working paper number DP-2013–29, November 2013; and *ASEAN integration monitoring report*, ASEAN Secretariat and World Bank, February 2014.

328 Logistics Performance index 2014, World Bank,.

329 World Bank Doing Business Survey 2014, World Bank, 2014.

330 Ibid.

clearance and technical control, ports and terminal handling, and inland transportation and handling. A score of 0 indicates that a country is equivalent to the global worst performer in customs cost.

### Free flow of services

We assessed the level of ASEAN integration in the services sectors based on the World Bank Development Economics Research Group's Services Trade Restrictiveness index.[331] The index assesses each sector's policies (in each country) that affect international trade in services according to the General Agreement on Trade in Services modes of supply, namely: supply of a service through cross-border delivery, establishing a commercial presence, or presence of a natural person. The score was calculated as the inverse to the index score. Where data were unavailable, proxy sectors were used (for example, the "professional" designation was applied to health care). The dimension is scored from 0 to 100, with a score of 100 indicating an open policy regime.

### Free flow of investment

The AEC aims to create an open investment regime among ASEAN member states. We scored the level of progress toward free flow of investment by drawing on the World Bank Development Economics Research Group's Foreign Investment Restrictiveness index.[332] The index assesses statutory restrictions on foreign ownership of equity within each sector (in each country), in terms of both new investment projects and existing companies. "Agriculture" was applied to the report's sectors of agriculture/fisheries and rubber. "Manufacturing" was applied to textiles, automotive, electronics, and consumer goods. Other sectors mapped individually. The dimension is scored from 0 to 100, with 100 indicating that full foreign ownership is allowed.

### Free flow of skilled labor

ASEAN's progress toward achieving the mobility of skilled labor was calculated by assessing regional progress (i.e., ASEAN-wide measures), together with country-specific measures toward open movement of natural persons. Eight mutual recognition agreements have been concluded (from 2005 to 2012) covering engineering services, nursing, architectural services, surveying, tourism, medical practitioners, dental practitioners, and accounting services. Of this list, our report covers only the health-care and tourism sectors, and our assessment of labor mobility addresses the extent of progress according to each of these mutual recognition agreements.

It is important to note for completeness that members also signed the ASEAN Movement of Natural Persons Agreement, which addresses business travel (not permanent entry or residence, or movement of unskilled workers). This discrete component of labor mobility is not directly addressed in the priority actions of the AEC Blueprint, and implementation of the provisions of the agreement has been unclear. Thus it was excluded from our analysis.

331 Services Trade Restrictions database, Development Economics Research Group, World Bank Group, June 2012.

332 *Investing across borders: Indicators of foreign direct investment regulation*, World Bank Group, 2012.

The Regional Progress score was multiplied by the Country Openness score to calculate a weighted overall dimension score for each sector:

- **Regional progress.** ASEAN is collectively working to establish common core competencies and standards to facilitate the mutual recognition of ASEAN professionals across member states, harmonize procedures, and facilitate the issuance of visas and employment passes. Based on the dimensions set out in each sector's mutual recognition agreement, we scored the region's level of integration on a scale of 0 to 100, with 100 indicating that ASEAN has drawn up and agreed to measures along all dimensions. To illustrate, in the tourism sector, ASEAN has published competency standards and curricula, and is preparing to launch a registration system for tourism professionals in 2015, but it has not standardized procedures for visa issuance. By contrast, there has been limited published progress in drawing up common standards and visa procedures for the health-care sector. Hence, the tourism sector scored 60, while health care scored 30.[333]

- **Domestic openness.** Given that recognition and mutual agreements are not sufficient to ensure market access, we scored the degree of openness of individual countries toward inbound foreign skilled labor based on domestic regulations. We accounted for regulations relating to quotas, establishment-specific restrictions such as limitations on size of organization or private sector only, restrictions relating to language or cultural barriers, and length-of-stay allowances based on regulations from national immigration departments and each country's commitments to ASEAN (as documented in the World Trade Organization General Agreement on Trade in Services, Horizontal Commitments and Schedules of Specific Commitments as published by the ASEAN Secretariat). A score of 0 indicates the sector is completely closed to foreign labor, a score of 25 indicates limited opportunities to enter, a score of 50 indicates major restrictions remaining, a score of 75 indicates minor restrictions, and a score of 100 indicates the sector is completely open.

333 The overall sector scores for labor mobility, which include both regional progress and domestic openness components, are 30 for tourism and 10 for health care.

# Bibliography

Aghion, Philippe, Nick Bloom, Richard Blundell, Rachel Griffith, and Peter Howitt, "Competition and innovation: An inverted-U relationship," *Quarterly Journal of Economics*, volume 120, number 2, May 2005.

Alliance for Financial Inclusion, *Putting financial inclusion on the global map: The 2013 Maya Declaration progress report*, September 2013.

American Chamber of Commerce Singapore and the US Chamber of Commerce, *ASEAN business outlook survey 2014*, August 2014.

Arnold, Jens, Giuseppe Nicoletti, and Stefano Scarpetta, *Regulation, allocative efficiency and productivity in OECD countries: Industry and firm-level evidence*, OECD Economics Department working paper number 616, 2008.

Asawachintachit, Duangjai, *Thailand: Automotive hub of Asia*, presentation, Thailand Board of Investment, Bangkok, Thailand, April 28, 2014.

ASEAN Secretariat, *ASEAN Comprehensive Investment Agreement: A guidebook for businesses*, 2013.

ASEAN Secretariat, *ASEAN economic community scorecard: Charting progress toward regional economic integration, Phase I (2008–2009) and Phase II (2010–2011)*, March 2012.

ASEAN Secretariat, *ASEAN integration in services*, August 2009.

ASEAN Secretariat, *Guide to ASEAN mutual recognition arrangement on tourism professionals*, December 2012.

ASEAN Secretariat, *Master plan on ASEAN connectivity*, January 2011.

ASEAN Secretariat, *We're stronger when we're connected: ASEAN ICT masterplan 2015*, January 2011.

ASEAN Secretariat and World Bank, *ASEAN integration monitoring reports*, January 2013 and February 2014.

Asian Development Bank, *ASEAN 2030: Toward a borderless economic community*, July 2014.

Asian Development Bank, *Asia's economic transformation: Where to, how, and how fast?* August 2013.

Asian Development Bank, *The economics of climate change in Southeast Asia: A regional review*, April 2009.

Asian Development Bank, *Facts and data about Southeast Asian infrastructure*, May 2012.

Asian Development Bank and ASEAN Secretariat, *The road to ASEAN financial integration*, April 2013.

Asian Development Bank and the International Labour Organisation, *ASEAN Community 2015: Managing integration for better jobs and shared prosperity*, August 2014.

Barbour-Lacey, Edward, *Thailand auto market accelerates into overdrive*, ASEAN Briefing, October 29, 2013.

Bhattacharyay, Biswa N., *Estimating demand for infrastructure in energy, transport, telecommunications, water and sanitation in Asia and the Pacific: 2010–2020*, Asian Development Bank Institute working paper number 248, September 2010.

Bloom, Nicholas, and John Van Reenen, "Why do management practices differ across firms and countries?" *Journal of Economic Perspectives*, volume 24, number 1, winter 2010.

Bold, Chris, *GCASH supports the Philippine government's programs*, Consultative Group to Assist the Poor, March 29, 2011.

Broadband Commission Working Group on Education and UNESCO, *Technology, broadband and education: Advancing the education for all agenda*, January 2013.

Cadot, Olivier, Ernawati Munadi, and Lili Yan Ing, *Streamlining NTMs in ASEAN: The way forward*, Economic Research Institute for ASEAN and East Asia working paper number DP-2013–24, October 2013.

Calvo-Pardo, Hector, Caroline Freund, and Emanuel Ornelas, *The ASEAN Free Trade Agreement: Impact on trade flows and external trade barriers*, Centre for Economic Performance discussion paper number dp0930, May 2009.

Centre for Liveable Cities and Civil Service College, *Liveable and sustainable cities: A framework*, June 2014.

Chairman's statement of the 23rd ASEAN Summit, in Bandar Seri Begawan, Brunei, October 9, 2013.

Chan, Vanessa, Marc de Jong, and Vidyadhar Ranade, *McKinsey Global Survey results: Managing the innovation portfolio to win*, February 2014.

Chia, Siow Yue, *The ASEAN Economic Community: Progress, challenges and prospects*, Asian Development Bank Institute working paper number 440, October 2013.

Chua, Jeannie, "The e-transformation journey of Singapore," in *National strategies to harness information technology*, Nagy K. Hanna and Peter T. Knight, eds., Springer, 2012.

Citi Research, *ASEAN long view: New pistons for a growth engine*, June 2014.

Citi Research, *Should we worry about wage inflation in ASEAN?* December 2012.

Das, Binayak, Ek Sonn Chan, Chea Visoth, Ganesh Pangare, and Robin Simpson, *Sharing the reform process: Learning from the Phnom Penh Water Supply Authority*, International Union for Conservation of Nature and Natural Resources and Phnom Penh Water Supply Authority, 2010.

Davidson, Charles M., and Michael J. Santorelli, *The impact of broadband on education: A study commissioned by the US Chamber of Commerce*, December 2010.

Dowdy, John, Joseph Hubback, Dennis Layton, and James Solyom, "Can you hack it? Managing the cybersecurity challenge," *McKinsey on Government*, autumn 2011.

Duflos, Eric, Paul Luchtenburg, Li Ren, and Li Yan Chen, *Microfinance in Myanmar: Sector assessment*, International Finance Corporation and the Pacific and Consultative Group to Assist the Poor, January 2013.

ECA International, *Most livable Asian locations*, April 2012.

Economic Research Institute for ASEAN and East Asia, *ASEAN strategic transport plan 2011–2015*, October 2010.

Economic Research Institute for ASEAN and East Asia, *Mid-term review of the implementation of AEC Blueprint: Executive summary*, October 2012.

Economic Research Institute for ASEAN and East Asia in cooperation with OECD, *ASEAN SME policy index 2014: Towards competitive and innovative ASEAN SMEs*, ERIA research report number 2012–8, March/June 2014.

Economist Corporate Network, *Riding the ASEAN elephant: How business is responding to an unusual animal*, March 2013.

Economist Intelligence Unit, *The data directive: How data is driving corporate strategy, and what still lies ahead*, Economist Intelligence Unit, commissioned by WiPro, April 2013.

Economist Intelligence Unit, *FTAs in South-east Asia: Towards the next generation*, 2014.

Economist Intelligence Unit, *The hype and the hope: The road to big data adoption in Asia-Pacific*, November 2013.

Economist Intelligence Unit, GlobeScan, and MRC McLean Hazel, *Megacity challenges: A stakeholder perspective*, Siemens AG, 2007.

Education Growth Advisors, *Learning to adapt: A case for accelerating adaptive learning in higher education*, March 2013.

European Commission, *The impact and effectiveness of the single market: Communication from the commission to the European Parliament and Council*, October 1996.

Evans, Peter, "Asia: Fixed telecommunications infrastructure," *Buddecom Report*, 17th ed., March 2014.

Felipe, Jesus, Arnelyn Abdon, Marife Bacate, and Utsav Kumar, "Product complexity and economic development," *Structural change and economic dynamics*, volume 23, issue 1, March 2012.

Fontagné, Lionel, Michael Freudenberg, and Nicolas Péridy, *Intra-industry trade and the single market: Quality matters*, Centre for Economic Policy Research discussion paper number 1959, September 1998.

Gautrin, Jean-Francois, *Connecting South Asia to Southeast Asia: Cross-border infrastructure investments*, Asian Development Bank Institute working paper number 483, May 2014.

Heintz, James, Robert Pollin, and Heidi Garrett-Peltier, *How infrastructure investments support the US economy: Employment, productivity, and growth*, Political Economy Research Institute and Alliance for American Manufacturing, January 2009.

Hout, Thomas M., and Pankaj Ghemawat, "China vs. the world: Whose technology is it?" *Harvard Business Review*, December 2010.

IBM, *The case for smarter transportation*, September 2010.

Iloilo, JICA, and Yokohama, "Community-based adaptation and resilience against disasters: Self-assessment workshop on disaster risk reduction," *CityNet*, volume 13, winter 2013.

Intal Jr., Ponciano, Yoshifumi Fukunaga, Fukunari Kimura, Phoumin Han, Philippa Dee, Dionisius Narjoko, and Sothea Oum, *ASEAN rising: ASEAN and AEC beyond 2015*, Economic Research Institute for ASEAN and East Asia, January 2014.

Intergovernmental Panel on Climate Change, *Climate change 2014: Impacts, adaptation and vulnerability*, March 2014.

International Energy Agency and Economic Research Institute for ASEAN and East Asia, *World energy outlook special report: Southeast Asia energy outlook*, September 2013.

International Finance Corporation, *Public-private partnership stories*, May 2010.

International Resources Group, *An assessment of water security, development and climate change in Iloilo, Philippines and the Tigum-Aganan watershed*, prepared for the US Agency for International Development (USAID), February 2013.

International Telecommunication Union, *Universal service policy for the provision of broadband to every school in ASEAN member countries*, October 2013.

Itakura, Ken, *Impact of liberalization and improved connectivity and facilitation in ASEAN for the ASEAN Economic Community*, Economic Research Institute for ASEAN and East Asia discussion paper number 2013–01, January 2013.

Kawai, Masahiro, and Ganeshan Wignaraja, *Patterns of free trade areas in Asia*, East-West Center policy studies number 65, 2013.

Koh, Jonathan, and Andrea Feldman Mowerman, *Towards a truly seamless single windows and trade facilitation regime in ASEAN beyond 2015*, Economic Research Institute for ASEAN and East Asia working paper number DP-2013–29, November 2013.

Kok, Philip Yeo Liat, and Vernie Oliveiro, *Public service capacity-building for local-level development: The Singapore Public Service—a case study*, United Nations Economic and Social Council, Committee of Experts on Public Administration, January 2012.

Lee, William, *The evolution of the networking skills gap in Asia/Pacific*, International Data Corporation, June 2013.

Leishman, Paul, "True money and M-PESA: Two unique paths to scale," *GSMA—Mobile Money for the Unbanked*, March 16, 2010.

Löffler, Markus, and Andreas Tschiesner, "The Internet of Things and the future of manufacturing," *McKinsey on Business Technology*, number 30, June 2013.

McKinsey & Company, *ASEAN competitiveness study*, March 2003.

McKinsey & Company, *The changing face of Asian personal financial services*, September 2011.

McKinsey & Company, *Digital banking in Asia: Winning approaches in a new generation of financial services*, January 2014.

McKinsey & Company, *The digital tipping point: McKinsey Global Survey results*, June 2014.

McKinsey & Company, *The evolving Indonesian consumer*, McKinsey Asia Consumer Insights Center, November 2013.

McKinsey & Company, *Online and upcoming: The Internet's impact on India*, McKinsey Technology, Media, and Telecom Practice, December 2012.

McKinsey & Company, "Shaping the future of manufacturing," *McKinsey Quarterly*, number 1, 2014.

McKinsey & Company, "Understanding ASEAN: Seven things you need to know," May 2014.

McKinsey & Company, *Understanding ASEAN: The manufacturing opportunity*, October 2014.

McKinsey & Company and CIMB ASEAN Research Institute, *Infrastructure, power and utilities + lifting-the-barriers roundtables*, 2014.

McKinsey Cities Special Initiative, *How to make a city great*, September 2013.

McKinsey Global Institute, *The archipelago economy: Unleashing Indonesia's potential*, September 2012.

McKinsey Global Institute, *Big data: The next frontier for innovation, competition, and productivity*, June 2011.

McKinsey Global Institute, *A blueprint for addressing the global affordable housing challenge*, October 2014.

McKinsey Global Institute, *Building globally competitive cities: The key to Latin American growth*, August 2011.

McKinsey Global Institute, *China's digital transformation: The Internet's impact on productivity and growth*, July 2014.

McKinsey Global Institute, *Disruptive technologies: Advances that will transform life, business, and the global economy*, May 2013.

McKinsey Global Institute, *Game changers: Five opportunities for US growth and renewal*, July 2013.

McKinsey Global Institute, *Global flows in a digital age*, April 2014.

McKinsey Global Institute, *How to compete and grow: A sector guide to policy*, March 2010.

McKinsey Global Institute, *India's technology opportunity: Transforming work, empowering people*, October 2014.

McKinsey Global Institute, *India's urban awakening: Building inclusive cities, sustaining economic growth*, April 2010.

McKinsey Global Institute, *Infrastructure productivity: How to save $1 trillion a year*, January 2013.

McKinsey Global Institute, *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity*, May 2011.

McKinsey Global Institute, *Lions go digital: The Internet's transformative potential in Africa*, November 2013.

McKinsey Global Institute, *Myanmar's moment: Unique opportunities, major challenges*, June 2013.

McKinsey Global Institute, *Offline and falling behind: Barriers to Internet adoption*, September 2014.

McKinsey Global Institute, *Reverse the curse: Maximizing the potential of resource-driven economies*, December 2013.

McKinsey Global Institute, *A tale of two Mexicos: Growth and prosperity in a two-speed economy*, March 2014.

McKinsey Global Institute, *Urban world: Cities and the rise of the consuming class*, June 2012.

McKinsey Global Institute, *Urban world: Mapping the economic power of cities*, March 2011.

McKinsey Global Institute and McKinsey Operations Practice, *Manufacturing the future: The next era of global growth and innovation*, November 2012.

Meyer, Margaret A., and John Vickers, "Performance comparisons and dynamic incentives," *Journal of Political Economy*, volume 105, number 3, June 1997.

Mourshed, Mona, Chinezi Chijioke, and Michael Barber, *How the world's most improved school systems keep getting better*, McKinsey Social Sector Practice, November 2010.

Nickell, Stephen J., "Competition and corporate performance," *Journal of Political Economy*, volume 104, number 4, August 1996.

Nicoletti, Giuseppe, and Stefano Scarpetta, "Regulation, productivity and growth: OECD evidence," *Economic Policy*, volume 18, number 36, 2003.

Ostojic, Dejan R., Ranjan K. Bose, Holly Krambeck, Jeanette Lim, and Yabei Zhang, *Energizing green cities in Southeast Asia: Applying sustainable urban energy and emissions planning*, World Bank, September 2013.

Oxford Economics, *Shaping the future of travel: Macro trends driving industry growth over the next decade*, commissioned by Amadeus, 2014.

Park, Yung Chul et al., "Combined study on assessing the financial landscape and formulating milestones for monetary and financial integration in ASEAN," mimeo, Bank Indonesia, 2011, as quoted in Maria Monica Wihardja, *Financial integration challenges in ASEAN beyond 2015*, Economic Research Institute for ASEAN and East Asia discussion paper number 2013–27, November 2013.

Pasadilla, Gloria O., *Addressing non-tariff measures in ASEAN*, Asia-Pacific Research and Training Network on Trade working paper series number 130, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), September 2013.

Perkins, Dwight H., *Industrial policy reform in Myanmar*, Ash Center for Democratic Governance and Innovation at Harvard Kennedy School and Rajawali Foundation Institute for Asia, April 2012.

Petri, Peter A., Michael G. Plummer, and Fan Zhai, "The ASEAN Economic Community: A general equilibrium analysis," *Asian Economic Journal*, volume 26, number 2, June 2012.

Petri, Peter A., Michael G. Plummer, and Fan Zhai, *The economics of the ASEAN Economic Community*, Brandeis University Department of Economics and International Business School working paper number 13, September 2010.

Pettman, Simon, *Standards harmonisation in ASEAN: Progress, challenges and moving beyond 2015*, Economic Research Institute for ASEAN and East Asia discussion paper number 2013–30, November 2013.

Plummer, Michael G., and Siow Yue Chia, eds., *Realizing the ASEAN Economic Community: A comprehensive assessment*, Institute of Southeast Asian Studies, 2009.

Pongsawat, Pitch, *Border partial citizenship, border towns, and Thai-Myanmar cross-border development: Case studies at the Thai border towns*, University of California, Berkeley, 2007.

Riguer, Mary Grace L., *ASEAN 2015: Implications of people mobility and services*, Institute for Labor Studies discussion paper series 2012, 2012.

Rosenthal, Stuart S., and William C. Strange, "Evidence on the nature and sources of agglomeration economies," in *Handbook of urban and regional economics*, 1st ed., volume 4, J. V. Henderson and J. F. Thisse, eds., Elsevier, 2004.

Sarrazin, Hugo, and Johnson Sikes, "Competing in a digital world: Four lessons from the software industry," *McKinsey on Business Technology*, number 28, winter 2012.

Saxena, N. C., *Virtuous cycles: The Singapore Public Service and national development*, Civil Service College, Singapore Ministry of Foreign Affairs, and United Nations Development Programme, March 2011.

Schmidt, Klaus M., "Managerial incentives and product market competition," *Review of Economic Studies*, volume 64, number 2, April 1997.

Schwarz, Adam, and Roland Villinger, "Integrating Southeast Asia's economies," *McKinsey Quarterly*, number 1, 2004.

Sheng, Yap Kioe, and Moe Thuzar, eds., *Urbanization in Southeast Asia: Issues and impacts*, Centre for Liveable Cities Singapore, Asian Studies Centre, and Institute of Southeast Asian Studies, 2012.

Smart Water Networks Forum, *Stated non-revenue water rates in urban networks*, August 2011.

Sourdin, Patricia, and Richard Pomfret, "Trade facilitation toward the ASEAN Economic Community," in *Tracing the progress toward the ASEAN Economic Community*, Shujiro Urata and Misa Okabe, eds., Economic Research Institute for ASEAN and East Asia, March 2010.

Spence, Michael, preface to *Urbanization and growth*, Michael Spence, Patricia Clarke Annez, and Robert M. Buckley, eds., Commission on Growth and Development, 2009.

Suryadi, Beni, "ASEAN Economic Community 2015: Integration of energy infrastructure," *The Energy Collective*, September 17, 2011.

Tacoli, Cecilia, "Rural-urban linkages and pro-poor agricultural growth: An overview," prepared for OECD DAC POVNET, Agriculture and Pro-Poor Growth Task Team, Helsinki Workshop, June 17–18, 2004.

Tan, Alan Khee-Jin, *Toward a single aviation market in ASEAN: Regulatory reform and industry challenges*, Economic Research Institute for ASEAN and East Asia working paper number DP-2013–22, October 2013.

Tan, Khee Giap, Mulya Amri, Linda Low, and Tan Kong Yan, *Competitiveness analysis and development strategies for 33 Indonesian provinces*, Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore, 2013.

Tan, Khee Giap, Woo Wing Thye, Tan Kong Yam, Linda Low, and Ee Ling Grace Aw, *Ranking the liveability of the world's major cities: The Global Liveable Cities Index*, Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore, 2012.

Tham, Siew Yean, and Wai-Heng Loke, "Industrial deepening in Malaysia: Policy lessons for developing countries," *Asian Development Review*, volume 28, number 2, December 2011.

Trucano, Michael, "Big educational laptop and tablet projects: Ten countries to learn from," World Bank Edutech blog, July 31, 2013.

UK Department for Business, Innovation and Skills, and Foreign and Commonwealth Office, *Review of the balance of competences between the United Kingdom and European Union: The single market*, July 2013.

United Nations, *World population prospects: The 2012 revision*, Department of Economic and Social Affairs, Population Division, June 2013.

United Nations Capital Development Fund, *Doubling financial inclusion in the ASEAN region by 2020: Outcome report of the Consultation with Southern Market Leaders in Financial Services for the Poor*, CARD Mutually Reinforcing Institutions, 2014.

United Nations Department of Economic and Social Affairs, E-government survey 2012: *E-government for the people*, March 2012.

United Nations Development Programme, *Human development report 2014—Sustaining human progress: Reducing vulnerabilities and building resilience*, July 2014.

United Nations Environment Programme (UNEP), *Towards a green economy: Pathways to sustainable development and poverty eradication*, December 2011.

Urata, Shujiro, and Misa Okabe, *Toward a competitive ASEAN single market: Sectoral analysis*, Economic Research Institute for ASEAN and East Asia project report number 2010–3, March 2011.

Urban Land Institute and the Centre for Liveable Cities, *10 principles for liveable high-density cities: Lessons from Singapore*, January 2013.

Urban System Studies, *Financing a city: Developing foundations for sustainable growth*, Centre for Liveable Cities, 2014.

US Congressional Budget Office, *The effects of NAFTA on U.S.-Mexican trade and GDP*, May 2003.

US International Trade Commission, *ASEAN: Regional trends in economic integration, export competitiveness and inbound investment for selected industries*, US International Trade Commission publication number 4176, August 2010.

Vietnam Official Development Assistance Office, *ODA infrastructure projects in Vietnam, 1991–2013*, Ministry of Planning and Investment.

Viriyapong, Ratchada, and Antony Harfield, "Facing the challenges of the One-Tablet-Per-Child policy in Thai primary school education," *International Journal of Advanced Computer Science and Applications*, volume 4, issue 9, 2013.

Vriens, Hans, "How will the new Southeast Asian community resolve its differences?" *Nikkei Asian Review*, June 12, 2014.

Vriens and Partners, *ASEAN economic community: Potential, reality, and the role for business*, May 2014.

Wan, Guanghua, and Matthew Kahn, "Green urbanization in Asia," in *Key indicators for Asia and the Pacific 2012*, Asian Development Bank, 2012.

Weinswig, Deborah L., Nathan Rich, Michael S. Palahicky, Rocco Francica, and Arielle S. Montgomery, *Weinswig's deep dive: Retail technology*, Citigroup Global Markets research, January 13, 2012.

Wihardja, Maria Monica, *Financial integration challenges in ASEAN beyond 2015*, Economic Research Institute for ASEAN and East Asia discussion paper number 2013–27, November 2013.

World Bank, *Doing business 2014: Understanding regulations for small and medium-size enterprises*, October 2013.

World Bank, *Preserving stability and promoting growth: East Asia–Pacific economic update*, April 2014.

World Bank, *Turn down the heat: Climate extremes, regional impacts, and the case for resilience*, June 2013.

World Bank Group, *Investing across borders: Indicators of foreign direct investment regulation*, 2012.

World Economic Forum, *Global competitiveness report 2013–2014*, September 2013.

World Economic Forum, *Global competitiveness report 2014–2015*, September 2014.

World Economic Forum, *The global information technology report 2014: Rewards and risks of big data,* April 2014.

World Economic Forum in collaboration with Deloitte Touche Tohmatsu Limited, *The future of manufacturing: Opportunities to drive economic growth*, April 2012.

World Tourism Organization and World Travel and Tourism Council, *The impact of visa facilitation in ASEAN member states*, January 2014.

World Trade Organization, *Regional trade agreements: Facts and figures*, June 2014

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